

# PATTERNS OF ECONOMIC ACTIVITY

*By*

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TO MY WIFE



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## PREFACE

Professor Koffka, in the introductory chapter of his *Principles of Gestalt Psychology*, says that "writing a book is a social act", and he asks "if one is justified in demanding the co-operation of society for such an enterprise". An economist would say, perhaps, that the writing of a book is an individual act and its "social significance" is determined by the economic sovereign, consumer's demand. It comes to the same thing: the producer must either justify his action or explain it, at least. I offer merely an explanation: Professor Koffka's suggestion of a justification is rather terrifying.

Every teacher of economics spends his first few lectures in conveying to his students an idea of the contents of the subject: every author of a book on economics follows this course in his first chapters. In giving this introduction teachers and writers alike attempt to find some formula that summarizes these contents, a formula which guides the students in deciding what is and what is not relevant to their work, that acts as a clue to the understanding of the theories and analyses presented by various authorities: a lodestone.

As a teacher of economics I have tried to present my students with such a lodestone and, until a few years ago it was not difficult to find, in a score or more works, one that would serve its purpose so far as the main body of English economics was concerned. Recently, however, it has become difficult. For a time I carried on with the old formulæ, but I found that the students had to discover better ones in the later stages of their work if they were to appreciate the new material coming into their ken. Sometimes this new material was new only in its arrival, as very important, in this country, sometimes it was new in the sense of being fresh discovery or fresh analysis only to be read in the journals perused by more advanced students. I became aware of a great difference between the "ideology" of beginners and more advanced students, a great difference between the "ideology" of the traditional authorities and the new ones. Other teachers must have had the same experience: some of them have told me so.

This book is based on the work which I have done with my second-year students in my effort to overcome the difficulty to which I have alluded. Particular examination exigencies made me hesitate to "try it out" on my first-year students and,

consequently, it bears traces of my assumption that readers already know something of the subject. I am so convinced, however, that it is much more economical to begin with the modern conception and work back to the traditional ones that I am now adopting this course with my first-year students.

Now, if one speaks of a modern approach, readers require to know what one means by it and I shall, therefore, state a few of the conceptions which, I think, are much more current in economic journals and studies which are being issued to-day than they were, say, just before the Great War, about twenty years ago. I do not suggest that the work done in producing this point of view has all been done during the last twenty years, but I do suggest that there has been a vast change in the emphasis on certain points and there has been a considerable development of new concepts.

In the first place, there has been a very strong development of the opinion that economics is a positive science and not a normative one. Twenty years ago it was reasonably true to say that most universities in this country taught that economics was concerned with the investigation of the conditions determining the maximum average wealth of the community or, as a variant, the maximum economic well-being of a community. To-day the more general idea is that economics is concerned with an investigation of the conditions of *equilibrium and disequilibrium* in the administration of resources. To some extent this is due, perhaps, to the fact that writers of to-day have much livelier experiences of disequilibrium than the writers of a generation ago, though it cannot be wholly due to this since much of the basic work of equilibrium economics had been done before the War. The works of Pareto, Walras, and Wicksell were not given great prominence then, though they existed.

Another circumstance leading to the departure from the older "wealth and welfare" approach has been the growing realization of the impossibility of measuring or conceiving of a means of measuring the elusive thing called "social welfare" or "material welfare" or "economic welfare". Modern psychology drives us away from it into the study of "equilibrium". One cannot read Dr. Shand's *Foundations of Character* with its theory of co-ordinating sentiments or Professor Koffka's *Gestalt Psychology* without feeling a certain sense of the crudeness of the idea that economics is concerned with the manifestation of man's acquisitive instinct or his satisfaction of a series of separate wants. We still remain interested in social well-being, but we are farther away than we have ever known ourselves to be from the conception of a quantity of it :

whatever social welfare may be it can probably be studied best as a condition of or an approach to a condition of equilibrium.

In the second place, there has, in recent years, been a very strong tendency to think of economic phenomena in terms of *structure*. Thus we have a revived and re-emphasized interest in that "capital structure" of society, the "price structure", the structure of competitive industry, the flow structure of money with its conditions of equilibrium and disequilibrium, the production structure, as well as the schemes of distribution of income and capital and the domestic budgets of certain income groups. This interest in social structure has emphasized the all-pervasiveness of the concept of "pattern" or "combination" making and it has emphasized the importance of the conception of *general equilibrium*.

Economics is the study of man in the production of these "structures", in the making of patterns; it is not the study of the determination of "a price" in "a market". "Particular equilibrium" has not, of course, been jettisoned, but it has been placed in perspective. The conception of the price scheme as the solution of a very complex equation allocating all available resources is now generally employed.

Along with the development of this conception of "general equilibrium" there has been a growing emphasis on the fact that the social system is dynamic and, therefore, there is a clearer appreciation of the need for a distinction between *economic statics* and *economic dynamics*. Experience has here been the great prompter. The disruptive effects of the Great War and the violence of the trade fluctuations have demanded the attention of economists with the result that there has been a great harvest of literature dealing with economic dynamics. In the same process of development the old, separate treatment of monetary theory has very largely ceased: money is a commodity of peculiar qualities, but it is one of the resources men employ and the patterns they produce with its assistance differ from the patterns that would exist in a "natural" economy.

In the third place, the *principle of substitution* which Marshall employed in his *Principles* has been given a much greater significance with the growing use of the conception of economic activity as a process of pattern making or structure production. This is due to the wider interest in the work of Pareto and the Lausanne school and, in particular, to the recent work of Dr. Hicks and Mr. Allen in the former's *Theory of Wages* and their joint work on *A New Approach to the Theory of Value in Economica*, and the work of Mrs. Joan Robinson in her *Economics of Imperfect Competition*, and Professor E. H. Chamberlin on *Monopolistic*

*Competition* Pattern making is a process of substitution, and its importance in economic theory cannot be exaggerated. A full understanding of it involves the understanding of the significance of choice, the significance of scarcity, of alternative possibilities, and the full understanding of the principle of economy itself

Lastly, there is no doubt that modern economics has turned back towards the early nineteenth century conception of the social system as a co-ordination of individual patterns of living: it represents a revival of *individualism*. The "practical" interest in Communism and State planning, schemes of organization based on the assumption of the objective ascertainment of an amount of "social welfare", has compelled economists to re-examine their fundamentals. This has led to the increasing rejection of the conception of a definable and measurable quantity of social welfare, as noted above, and to a clearer realization of the fact that it is only through price or exchange value in terms of money that there can be established any scale of "social values" or values socially determined. The social determination of values is an equilibration of individual values

As a result of this individualistic development the old disputations concerning the functions of government have been renewed with their old intensity of interest. In this disputation the individualist case is presented most vigorously perhaps by the new Austrian school, Professors von Mises, Halm, and Hayek, and Professor Cassel. The facts still remain, however, that States exist and act and that moral codes are formulated. The relationship between the exercise of individual freedom and the framework within which this freedom is exercised is a matter for investigation of pressing necessity. To me it seems that modern economics will inevitably be driven to apply its technique to problems that have hitherto been regarded as political. One of the most positive contributions to this investigation is Professor Commons' *Institutional Economics*, and I regard this work as an integral part of modern economics.

These are the conceptions which I regard as the characteristics of what I call the modern approach, and it is with these in mind that I have written this book. I make no claim to any originality of theory. There may be, there are sure to be, certain modes of expression of an individual character; there are probably idiosyncracies; but these peculiar modes of expression and idiosyncracies are not intended to masquerade as originalities. There are one or two implications of the modern trends to which I have given, perhaps, unusual emphasis. I have, for instance, suggested that "scarcity" has been given too much prominence as a cause of economic activity; this seems to me to follow from the use of the conception of substitution, a process which assumes



given quantities of resources. Further, I have emphasized what I consider to be a real need, that of carrying economic methods and analysis into the making of social decision (including "political decisions") The suggestion that we should consider economics as primarily concerned with the administration of resources rather than the exercise of "property rights" makes this widening of the field of study inevitable. the distribution of property is part of the economic process of establishing satisfactory juxtapositions of men and things, which is the principle of economy.

I am aware of the inadequacy of my treatment of the "political" aspect of economics. I have included it, however, because I think it must be included and because I think it is an aspect that must be developed. It may be that I have not given sufficient weight to the co-operative pursuit of common ends and that I have suggested rather too strongly that "power" lurks in the economic system. If I have, I feel sure that it is only the emphasis that is wrong. I think that power does form the framework within which we exercise our freedom. Nevertheless, as our economy develops within a wider rationality, I think the importance of the common pursuit of common ends will develop; I think that the real measure of the existence of a community is to be found in the extent to which this commonness of aim exists. But I cannot escape from the thought that Society is emergent and that our present social economy is one which is growing out of the "jungle" economy into a rational economy in which aims that are common emerge. It is for this reason that I close my last chapter with the expression of an opinion that it is to the development of our knowledge of human nature rather than to our conquest over external nature—by establishing, say, a condition of plenty—that our society will proceed towards its equilibrium.

In this statement of some of the main characteristics of modern economies I have made no reference to methodological developments except to point out that there is a trend towards more positive work. The extension of the use of mathematical analysis, the clearer definition of economic statics and dynamics<sup>1</sup> and the attempt to erect a structure of formal laws are, perhaps, the most noteworthy developments. On this aspect of economic investigation, Professor Robbins' *Nature and Significance of Economic Science* is a clear and authoritative statement.

The consideration of methodology is beyond the scope of this book. My object in writing it was, as I said at the beginning of this preface, to meet a need I have felt as a teacher. Students

<sup>1</sup> Professor Pigou's *Economics of Stationary States* is an excellent study of economic statics, but the greater part of this book was written before it appeared.

in comparatively early stages should be given some of the main conceptions that lie at the back of the minds of our modern writers. In defining economics as the study of man as he makes patterns of material resources I think I am interpreting modern thought fairly correctly and, in order that students shall appreciate it fully, I have concentrated on presenting the patterns which are of main interest. Patterns of property rights, patterns of control, patterns of physical possibilities, patterns of psychological tendencies, patterns of commercial possibilities, patterns of individual administration, patterns of value possessed, patterns of "contentment", patterns of prices, patterns of resources, patterns of money and value flows—these are some of the "pictures" I have attempted to conjure up in the minds of readers. And along with the patterns I have attempted to show the pulls and counterpulls, forces, and attractions that determine them. This concentration of attention on pattern-making, with the consequent arrangement of my matter is, perhaps, a feature which I may regard as new.

I have used a considerable number of diagrams. The concept of "pattern" is a pictorial concept; at least, that is how I regard it. To those who are "at home" in mathematical abstractions these diagrams may appear a concession to weaker minds! I use them because I think that students find them helpful: and they serve to fix their minds firmly on the socio-economic organization which economics is concerned to explain. To study a diagram showing, by radial lines bounded by polygons, the patterns of expenditure in households of various incomes is an excellent introduction to the science of pattern making.

In preparing a book which makes a wide survey of the field of economics, it is impossible to acknowledge all sources of suggestion, but there are several to whom I owe special debts of gratitude for reading the manuscript and giving me much valuable advice: these good friends are Professor George O'Brien, Professor Lionel Robbins, and my colleagues, Professor R. M. Hewitt, Mr. Frank Underwood and Dr. F. A. Wells. Along with these creditors I place my old student and friend, Mr. Cyril Osborne. I thank them most earnestly, though, of course, I load them with no responsibility for anything I have written.

I also thank my wife for all that she has done in helping me to make my work presentable, but especially for the forbearance which she has shown so often when she must have thought some alternative use of my time would have been more profitable!

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*January, 1936.*

# INTRODUCTORY

## THE ECONOMIC ASPECT OF HUMAN LIVING

Every activity of which man is capable involves the use of material or physical resources. This is plain enough in the ordinary activities of eating and drinking, clothing and sheltering; it is equally clear in the processes of industry and trade, but even in respect of the least so-called "material" activities, such as intellectual and religious exercises, the statement holds true. The most self-denying recluse, pursuing the contemplative life, uses himself—his body and brain—and the spot of earth on which he sits or lies, and his body and the earth are physical resources. Abraham, making his peace with God, used a lamb as sacrifice; church congregations in modern times, for corresponding purposes, require their buildings, musical instruments, and prayer books. The consulting physician uses his own energy in speech or writing. The painter uses his canvas and the orator his platform and audience.

The significance of this basic fact, that in all activities men must employ physical resources, is that it is possible to say that there is a "physical" aspect of all human behaviour. The whole process of what we call "living" may be regarded as a process of making patterns of material things. It consists of arranging "things"—including man himself—of establishing certain physical juxtapositions in time and space.

Economics is the study of man's administration of material resources. It is not the study of a particular group of human activities, such as buying and selling; it deals also with the activities of a man in isolation, such as Crusoe. It is not the study of man in the satisfaction of certain specific desires, such as the desire for food, the so-called "material" satisfactions<sup>1</sup>; it is the study of the whole of human living from one point of view, that from which man is seen making patterns of physical resources.

<sup>1</sup> See Cannan, E., *Wealth*, p. 18, 1st ed.: "We shall never be able to say that 99 per cent of a martyr's welfare was non-material and due to religious fervour and the remaining 1 per cent was material and due to the sustaining effects of the food he ate a week before (his death). But we can quite legitimately and usefully consider what will increase or diminish the more material side of his happiness, or, shortly, his material welfare." See Robbins, L., *Nature and Significance of Economic Science*, pp. 4-9, for a refutation of the "material welfare" conception as the central idea of economic study.

That this is the aspect of life which is of interest to the economist is clear from the kind of question which he is called upon to answer. Why do the Chinese eat rice and the English eat wheat? Why do railways in this country employ coal-consuming engines rather than oil or petrol or electrically-driven engines? Why are some people richer than others? Why do people spend diminishing percentages of their income on necessities and increasing percentages on comforts and luxuries as their incomes increase? Why do we adopt the organization of work known as the "division of labour"? Why are some businesses larger than others?

It is clear that full answers to all of these questions would require all knowledge of physical and biological sciences, of moral codes and legal enactments, of physiology and psychology, of religion and æsthetics. It is equally clear that no single economist could hope to give full answers to them all, and yet they are questions of an economic character. Specialist students will give full answers to one or two, and their answers will reveal detailed knowledge of some of the sciences and studies mentioned, but their statements will, if full explanations, be "economic exercises". They are economic because they are concerned with the investigation of the question, What determines this particular pattern of physical resources?

There are many studies of specific patterns, any and every pattern of resources calls forth treatises which are given the title of economics. We have the economics of transport, the economics of coal, the economics of textiles, the economics of engineering: domestic economics, business economics, social economics. All of them are concerned with some particular pattern of resources and are attempts to show why the patterns consist of the resources of which they do consist, combined in the proportions in which they are combined. In addition there are the two extensive studies of economic geography and economic history. Extensive as they are, they are special studies in the much wider field of economics. Economic geography is concerned with the variations in patterns of physical resources (modes of living) from area to area or with the spatial distribution of man's activities and the resources employed by him. Economic history is concerned with changes in the patterns of living through time. Each of these studies is concerned with one dimension of the economic or material structure of living, the former with locational relationships in space and the latter with locational relationships in time.<sup>1</sup>

<sup>1</sup> See Power, Eileen, "On Mediaeval History as a Social Study," *Economica*, 1934, pp 13 et seq, for a discussion of the relationship between Economics and Economic History. Also Robbins, L., op cit, p. 37.

All these studies are economic studies because they are concerned with the explanation of the dispositions of material resources, but it is clear, as we have said, that no person could ever hope to be an economist, surveying the whole organization, if he were expected to give full answers to the questions asked. The economist, however, is a specialist and his special field is the general process of administration of physical resources. He abstracts from all pattern making the principles of pattern making<sup>1</sup>.

The first concept which it is necessary for the student of economics to grasp is, clearly, the concept of pattern, and it will facilitate his apprehension of the concept if we distinguish between an individual's pattern and a social pattern, describing the former first.

An individual's pattern of living consists of a group of material resources of various kinds and quantities, in certain spatial and temporal juxtapositions, bound together through their qualities and quantities, time and space locations possessing some sort of significance to the individual pattern maker or spectator. The essential feature of an individual pattern is the unity of these significances.

The unity of significance which is possessed by the elements in a person's pattern is established through their having effect on his feeling of satisfaction. All the resources which are in the group which he regards as constituting a pattern he regards as being desired there or not desired, having utility or disutility, rendering services or disservices. The unity of significance is further emphasized by the fact that a change in the quantity, quality, time or place location of one resource affects the utility or service which can be attributed to another or others. They render their "contributions" collectively or, in other words, the services they render depend upon their relationships with one another.

When we turn from an individual pattern to consider a social pattern we meet a difficulty at once. The individual can say whether a given spatial or other relationship is satisfactory or not, but a society cannot. A society has no single thinking, feeling, or willing faculty, it is made up of a number of individuals who think, feel,

<sup>1</sup> Cf. Robbins, L., op. cit., p. 15. "Economics is the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses." p. 29. "Economics brings into full view that conflict of choice which is one of the permanent characteristics of human existence." "Pattern making" is "behaviour" involving "choice" and, therefore, implying "alternatives". With respect to "scarcity", see p. 7 below. Professor Schumpeter, *The Theory of Economic Development*, p. 74, speaks of the entrepreneurial activity as a process of making "new combinations". Since, according to the present writer's opinion, all economic activity is "entrepreneurial", all living is "combination" making or "pattern" making. The choice of terms is, perhaps, a personal matter. For the nature of economic generalizations, see Robbins, L., op. cit., chaps. iv and v.

and will. There is, then, no such thing as a social satisfaction, and if we are to describe a social pattern we shall need to express ourselves in a rather different manner

A resource of a certain kind, quantity, time and place location is an element in an individual's pattern if it has significance to that individual. If, however, it has significance to several individuals it is an element in several individuals' patterns. This makes it an element in a group pattern. A group pattern or social pattern includes all those resources which are of significance to various members of the group. When men live in close proximity to one another the juxtapositions that one person establishes are of significance to another; hence there is a social pattern or scheme of dispositions of resources significant to more than one person.

Having defined the content of the term *pattern* we must now consider what we mean by *pattern making*. This will involve our consideration of individual pattern making and social pattern making, and we will follow our last procedure by considering first the making of a pattern by an individual living in isolation.

The first fact in connection with pattern making to which we must draw attention is that to our isolated person, operating at a given moment, the resources of which his pattern is to be made are *given*. They consist of certain quantities of certain kinds of resources, located in certain places. From this it follows that any pattern which he makes can only be made as an alteration of the given pattern or given distribution, through space, of the given resources<sup>1</sup>. This is a physical necessity and its statement is a variant of the statement that man creates nothing but rearranges only: he "creates" nothing but a pattern.

There are two most important implications of this fact. In the first place it is clear that our pattern maker can only make his pattern if he can alter the physical juxtaposition of his resources. This means that a condition of pattern making is that *resources are capable of alternative dispositions*. By being capable of alternative dispositions we do not mean that every resource must be capable of physical movement or change of "nature", all that we mean is that the juxtaposition must be capable of alteration. If Mahomet goes to the mountain the disposition of the mountain is affected as well as that of Mahomet: their spatial relationship is altered.

<sup>1</sup> "In practice, of course, Society, like the Isolated Man, has never to start from the beginning and decide how much time or labour shall be given to the production of food, how much to clothes, and so on. *Some distribution is in force, and all that has to be decided is whether this distribution shall be slightly altered in one direction or another.*" Cannan, E., *Wealth*, p. 36 (italics ours). "The fundamental characteristic of a displacement system is that the total quantity of resources is fixed," Boulding, K. E. The Place of the "Displacement Cost" concept in Economic Theory, *Econ. Journal*, 1932, p. 138.

The second implication of the circumstance of given resources is that *when a pattern is made, a pattern is destroyed*. If, further, our pattern maker has in mind several possible patterns of the given resources which he might make, it follows that the selection of one of the patterns involves his destruction of the existing pattern and the rejection of all but the selected one. *Pattern making, then, is a process of substitution*. one scheme of juxtapositions is substituted for another

Recalling what we said above concerning the nature of a pattern, we can see that, when a substitution of one pattern for another is made by our pattern maker, he really makes a substitution of one scheme of services for another and if he makes a selection from several possible patterns in his mind he rejects several schemes of service and chooses one. Since services are satisfactions, it follows that pattern making may also be regarded as the substitution of one "scheme of satisfactions" for another.

The second feature of pattern making is that the pattern must be envisaged in the mind of the pattern maker and this implies that he must know what substitution possibilities lie before him. Not all juxtapositions of resources are established by men knowing what they are doing, but in so far as they make patterns they direct their resources in the light of an understanding—partial, at least—of what they are doing. If they do not, then they do not administer, they merely behave. *Pattern making is essentially a rational process*<sup>1</sup>

We are now in a position to understand the meaning of *economy*, which has given the title of *economics* to the subject. The word "economy" is derived from the Greek *oikonomia*, which meant originally "household administration", but it has lost its necessary association with the household and to-day it really means the principle of administration. When a man administers his resources he makes a pattern of resources; when he makes a pattern of resources he makes a substitution of one scheme for another or gives up one scheme of satisfactions for another<sup>2</sup>; in other words,

<sup>1</sup> This does not mean that all dispositions are rationally made, but it *does* mean that the only assurance of really economic administration of resources is that it is performed with an understanding of results. See below, Section III, Chap. IV. See Robbins, L., *ibid.*, p. 140, Knight, F. H., *Risk, Uncertainty, and Profit*. Also Pigou, A. C., *Economics of Stationary States*, p. 3. "In this book the economic cosmos will rather be regarded as an overflowing of the human spirit, as something that we build, at least in part, by conscious process and that is understood only when it has been related to that process."

<sup>2</sup> That the whole of economic administration is a process of substitution is implicit in the conception of "general equilibrium" developed by the Lausanne School. See Walras, L., *Elements d'économie pure*; Pareto, V., *Manuel d'économie politique*; Ricci, U., "Pareto and Pure Economics," in the *Review of Economic Studies*, 1933; Hicks, J. R., "A Reconsideration of the Theory of Value," *Economica*, 1934.

he produces such a scheme of juxtapositions of resources that he attains, within the possibilities revealed to him by the light of his understanding of his resources, the maximum satisfaction. The principle of economy, to an individual, is the principle of administration known as "making the best of circumstances", or obtaining the maximum service or satisfaction from a given group of resources.

Now when we have fully apprehended that the process of administration is a process of substitution,<sup>1</sup> and that the principle of economy is the principle of selecting the best substitutions from all possible substitutions, we find ourselves impelled to reject what we may regard as the almost universal opinion of economists concerning the *cause* of economy. Most economists say that men must exercise economy because means are scarce, relatively to desires. The principle of scarcity is laid down as the first principle of valuation and economy is defined as the "principle of smallest means",<sup>2</sup> the principle of utilizing as little as possible for a given end. Nature is niggardly and we are "pinched" for means to satisfy our wants.

That men usually desire more than they can obtain is a fact and we are not concerned to deny it. Nature may be niggardly, though it is possible to present a case for her bountifulness. Economical administration is not, however, due to the fact that men cannot have all they desire, it is necessary even when they can attain their desires. The circumstance that causes men to make substitutions is the circumstance that they see *possible* patterns of resources which are better than the existing or future uncontrolled patterns. The pursuit of the desired pattern may mean—always does mean—the increase of the quantity of a resource at some point in time and space, but it may also mean the reduction of a quantity somewhere and somewhen. A substitution may take place to rid our pattern maker of a surplus of something as well as to remove for him a deficiency.

Nature, it is true, imposes her limitations: if she did not she could not give possibilities. One thing cannot be in two places at once, but many of them can be in two places at different times, two things cannot be in one place at once, but they can occupy the same place at different times. A thing cannot possess two forms at once, but it can exist in two forms at different times. A resource cannot be moved from one place to another without other resources being employed, and from this it follows that the resources being employed in the removal cannot be used elsewhere. The juxtapositions of things can be changed, and this possibility is the condition of

<sup>1</sup> Marshall, A., *Principles of Econ.*, p. 341. "The applications of this principle extend over almost every field of economic inquiry."

<sup>2</sup> Cassel, G., *Theory of Social Economy*, p. 9.



our administration. We can only administer resources that are given in quantity, quality, time and place locations, but these limitations are not scarcity. Men may want relationships established amongst resources that are incompatible with one another, and some of these incompatible relationships might be removed by increasing quantities of certain resources, but there are relationships which are compatible with one another, and the principle of economy is the principle of selecting the best of these compatible relationships amongst a given group of resources : in other words, making the best possible substitution <sup>1</sup>

<sup>1</sup> " Here, then, is the unity of subject of Economic Science, the forms assumed by human behaviour in disposing of scarce means Economics is the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses " (Robbins, L, *Nature and Significance of Economic Science*, p 15) " The Manna which fell from Heaven may have been scarce, but, if it was impossible to exchange it for something else or to postpone its use, it was not the subject of any activity with an economic aspect " (ibid, p 13)

Though he does not regard scarcity of means used as the sole condition of economic behaviour, Professor Robbins does regard it as an essential condition, the other essential is that the means shall have alternative uses from which choice shall be made Our contention, in the text above, is that the possibility of alternative uses is a full and sufficient cause of economic activity, substitution is the process of using resources in one way rather than another

The only conditions under which no administration can take place are two : (a) when no change in the physical juxtaposition of resources is possible, and (b) when all juxtapositions are such that no change for the better can be considered In the former case the impossibility is due to physical unchangeableness, in the latter case the lack of administration is due to the alternative uses being less satisfactory than the unchanged use In neither case does the question of scarcity arise

Now it is perfectly true that in both of these extreme cases, and in all human activity where modification of circumstances is possible the resources which men administer are *given* in quantity That must necessarily be the case or substitution could not take place But the fact that quantities are given does not mean that they are scarce They may be, on the contrary—and they frequently are—in excess In fact, we may go further and say that if substitution takes place it is because, *in the given circumstances*, there is an excess of resources in some part of the scheme of living and a scarcity of resources in some other part In no other way can physical juxtapositions be altered

We may illustrate our position by considering a system of water tanks connected by pipes at their bases Any water placed in one will flow into the others, finding a single level where there is an equal pressure all through the system The *flow* may be regarded as a process of substitution, substitution of water in one tank for water in another, until no further substitution is possible We do not say that substitution here takes place (i.e. flow) because the level of the tank to which the water flows is low, we attribute the flow to the *difference* of level, the difference of pressure So in all economic activity : men make substitutions, alter the dispositions of things, because the " pressure of satisfaction " impels them so to do Means flow from one place to another, quantities are reduced here and increased there, until they are so distributed that satisfaction demands no further substitution or flow They flow from " relative plethora " to " relative scarcity ".

The rejection of scarcity as the cause of economic activity does not mean that scarcity must never be discussed But it does mean that, analytically,

Before we pass on to the consideration of social or group pattern making it will be an advantage to reconsider the process of individual administration of resources in another way, using a set of different concepts. Hitherto we have spoken of an administrator as making a rational selection of possible patterns of resources, deciding this pattern on considerations of satisfaction. It is possible to take a point of view which is placed, so to speak, outside the mind, and consider the process of pattern making as an astronomer considers the grouping of stars. When we speak of choice and satisfaction we are speaking as men knowing something of the psychological experiences associated with administration. The astronomer cannot take the point of view of the stars—though, perhaps, when he speaks of attractions, counter-attractions, repulsions, tensions, etc., he is using concepts coloured by his experience.

When a person is making a disposition of his resources we may say that the scheme of dispositions in his mind has a certain attractiveness to him and that this attractive force is transmitted through him to the resources in their present forms and locations. Thus we may conceive of the resources of which he is making patterns as being in a state of tension. There are physical necessities which give direction, so to speak, to these tensions. Thus the desire for a meal puts a tension on the food in the larder, and this tension is transmitted to the labour and other resources which must be employed to prepare the meal. The process of administration is a process of revolving these tensions: they are only resolved when things are in their best juxtapositions. We may say, then, that

plethora is equally important. Scarcity of a commodity in a particular person's possession, scarcity of it at a particular point in time and space, is important, and it may be that men are more conscious of scarcity in their lives than they are of plethora, but this does not mean that plethora may be ignored. Economics is the study of man removing relative plethora and relative scarcity, and one cannot be mentioned without the other.

Between the two parts of the first quotation given above Professor Robbins says: "The economist studies the disposal of scarce means. He is interested in the way different degrees of scarcity of different goods give rise to different ratios of valuation between them." This we certainly accept, but we go further and say that the economist is interested also in degrees of plethora and the degrees of disutility attaching to commodities and their "negative valuations." In fact, it is one of the prime functions of the economist to *explain* the phenomenon of value. Some things have high positive values—men are ready to give something up to acquire them, some have high negative values—men are ready to give up something to be rid of them, some have zero value. But economic activity is concerned with all of them, though in different ways.

In the discussion of scarcity, abundance, and plethora, and their relation to value, it would seem better to fall back on the non-committal expressions of mathematicians. "The degree of utility varies with the *quantity* of the commodity" (Jevons, W. S., *Theory of Political Economy*, p. 57, 2nd ed.) See Boulding, K. E., "The Place of the Displacement Cost concept in Econ Theory" (*Econ. Journal*, 1932).

a person's resources are always in a state of tension and that there is a tendency—an inevitable and necessary tendency—for the tension to be resolved and an equilibrium to be established.

The principle of economy is, then, in this particular terminology (a terminology which is being increasingly employed to-day by economists), the tendency towards equilibrium. Tensions exist on resources, pulling them into such relative positions as are desired by the administrator, man. To an individual, the equilibrated disposition of resources is economical administration, giving him the best in the circumstances.<sup>1</sup>

With this conception in mind of pattern making as a process of resolving tensions on resources, we see at once that the tensions may arise from a single administrator or from a number of administrators. A given group of resources may be considered by several persons and the tensions on the resources arise from the existence of different patterns in the minds of different persons. The principle of economy in a social group is, then, the resolution of tensions upon resources established by different patterns in the minds of different persons and social administration is the tendency towards an equilibrium of these tensions.

Social administration is not conducted by some super-person, the state, or the community; it is conducted by every individual in the group. It is a resultant of individual administrations, the disposition of resources effected by a number of people. If social economic equilibrium were attained at any time the position would be such that every person's administration of resources was compatible with every other's, and no person would consider any possible substitution which he could make as making his administration more advantageous. Every individual would live his own life, exercising certain freedoms in the way of making substitutions of resources; in other words, in the social equilibrium every person has his property and personal "rights" or freedoms and exercises them.

In this perfect equilibrium every person would utilize his "own" resources in his own way and among the substitutions he made would be some which we regard as exchanges. Exchange is a process of substitution of property voluntarily made by the exchange parties; it is a part of the economical process, but before exchange can take place it is obvious that men must possess property. Property is, however, itself, simply a manifestation of the principle of economy, the outcome of men's substitutional proclivities.

It has been said that the necessity of property arises out of

<sup>1</sup> See Robbins, L., *Nature and Significance of Economic Science*, p. 18. Edgeworth, F. Y., *Mathematical Psychics*, p. 12, where he speaks of the "Mécanique Sociale".

scarcity of means<sup>1</sup> Since men want, together, more resources than there are available, some allocation of them must be made. It is true that if men do require more than are available some distribution must be decided upon as part of the process of establishing a social equilibrium. But the condition of tension upon scarce means is only one form of tension that needs to be resolved in a society. There may be conflict with respect to some specific resource which cannot be resolved by an increase of its quantity. The cause of conflict is the incompatibility of two desired allocations of some specific resources, it may be removable by the increase of its quantity, in which case scarcity may be regarded as the cause, but it may be such as cannot be removed by increase of quantity, in which case scarcity is not the cause. The conception of scarcity, however, obscures the view of the real nature of property determination as well as the view of the general principle of economy.

In the process of substitution the relations between men may be of various kinds. Individual substitutional activities may, in certain cases, reinforce each other, establishing certain juxtapositions of things by co-operation, in certain cases their substitutional activities may be adjusted by exchange; in others they are reconciled by conflict and the assertion of power. When power prevails, or an equilibrium of power is established, the position is such that no one can, by exercising force, make a substitution which improves his state of satisfaction.

The social economy consists, then, of the distribution of property through the exercise of power and the adjustment of this property distribution by exchange and gift. It is the allocation of resources, the establishment of juxtapositions of resources, resulting from the interaction of individual economies.

The processes whereby the equilibrium of property is attained are the processes of social administration and the resulting equilibrium is the condition of what some authorities regard as maximum social satisfaction. Since, however, there is no super-social being who can experience social satisfaction, it is better not to use the term.

The economist studies the principles of equilibration within an individual administration and among different individual administrations.<sup>2</sup> He considers the condition of equilibrium and examines the possibilities of its attainment. He is not concerned with the

<sup>1</sup> Hume, David, *Essays, Moral, Political, and Literary*, ed. by Green and Grose, vol. II, pp. 179-181.

<sup>2</sup> Mises, L. von, "Economic Calculation in the Socialist Commonwealth," *Collectivist Economic Planning*, Essay III. See also Essay V, "The Present State of the Debate," by the Editor, Hayek, F. A. von, pp. 214 et seq., *Prices and Production*, Hayek, F. A. von, p. 4.

questions of whether the equilibrium attained is right or good ; he is merely concerned with its determination or frustration.

Having given some idea in this introductory chapter of the process of living as seen by the economist and of the principle of economy which is, to the economist, the principle of living, we must now give some explanation of the scheme of this book, which is intended to develop the understanding of economy.

Sections I and II, though rather long, are intended to be somewhat of a preliminary to the remaining sections. They may be regarded as presentations of the various kinds of patterns in which the economist is interested. It may be said that this chapter has suggested that the only patterns of interest to the economist are patterns of physical resources and, in an ultimate sensé, they are. By considering the making of patterns of physical resources as the central matter of interest, economic studies can, in the opinion of the present writer, be most conveniently gathered into a unity. In the process of making these patterns, however, situations are developed which may themselves be regarded as patterns, and a consideration of them, in some detail, reveals more fully the nature of the factors determining the pattern of physical resources.

In Section I the pattern called the property structure is presented. We assume that it has been established and show its significance in the distribution of control over resources. We also discuss the distribution of satisfaction. Schemes of distribution are patterns, and the process of pattern making in physical resources involves the construction of these patterns. Section II differs from Section I in that it presents the view of living as a pattern through time, and in the consideration of the patterns of physical resources, utilities or satisfactions, and money values, through time, we become aware of some of the conditions of a constant flow as well as the conditions of variation of flow patterns. These two sections give us a picture of the economic system as a system of physical juxtapositions, of money values, and psychical significances at a moment and through time. They are intended to show that the conditions of perfect equilibrium in a social economy are to be found in physical possibilities, compatibilities of prices, and the mutual acceptance of individual patterns as well as in the individual's own psychological make-up.

In Section III we study the principles of administration. Again we view the process in its physical, financial, and psychical aspects. The individual is shown as making his substitutions of physical resources, and the function of the technologist is explained. As making substitutions of money values, the commercial administrator's pattern making activities are analysed, and the ultimate sovereignty

of "satisfaction substitution" concludes the section. The laws of returns, physical, financial, and psychical, along with those of mixed nature, physico-financial, etc., are given some prominence here, and the conception of the pattern of resources as lying implicit in the given physical, financial, and psychical data is expounded.

Sections IV and V deal with the social economy. In Section IV the production of a price scheme is explained as the interaction of individual substitutional activities and the conditions of a stable price structure are presented. The circumstances causing disequilibrium of the structure are analysed and the conception of a dynamic system is outlined. Throughout the section the problems of price and income determination are approached from the point of view of a general equilibrium and thus has an interesting bearing on the conception of the market with its varying degrees of competition and monopolism. Section V deals with the place of the State in a social economy and then discusses the relationship between the framework of law and custom and the pricing or free exchange system. In it we attempt to show that all socio-economic "ills" lie in the framework of freedoms and, since changes in the framework within which pricing takes place cause a certain amount of dislocation, we show the similarity between the relationship of the pricing system to social reform and other forms of progress.

The section finishes with a discussion of the meaning of rational social administration and shows some weaknesses of some suggestions for social reorganization. This discussion is not entirely negative and during its course the economic significance of social and natural philosophers is emphasized, marking a great movement from the ideas of the Classical economists.

## SECTION I

### *THE ECONOMIC STRUCTURE AT A MOMENT OF TIME*

#### CHAPTER I

#### INTRODUCTORY

Since economics is the study of man's administration of his material resources, it will be profitable if we first take a general view of the pattern of resources which exists at a given moment of time. The process of living is a continuously changing scheme of resources, and a complete survey would, of course, be something in the nature of a cinematograph. The major portion of the book will be devoted to the presentation of the moving picture, but in this section we shall be content with four snapshots. These will enable us to accustom our eyes, so to speak, to certain features in the picture, to get a steady focus, so that when we pass on to consider the moving picture we shall be better able to perceive those things which change.

Our first view of the economic organization will reveal the distribution amongst members of the community of freedoms and unfreedoms with regard to the uses of material resources. As we explained in our preliminary chapter, the unity of a pattern is established through the relationships of resources to the pattern makers and, therefore, we must at once appreciate the fact that the economic organization of society is a composite of all the patterns of all the social units composing the community. These units have certain degrees of freedom, mutually determined, known as rights of property, and certain degrees of unfreedom, known as duties, with regard to the employment of resources; within these fields of freedom the various units make their patterns. We shall indicate in this survey the types of units which exercise control over resources for the furtherance of their own particular ends. Then we shall proceed to identify the various kinds of resources which units hold and classify them into real resources (personal and non-personal) and pseudo-resources (money and securities). Along with securities we shall include liabilities. This classification will enable us to indicate the relationship between the schemes of *holding* and

*owning*. We shall note that "holding" is derived from the conception of physical control and that, in the ultimate business of living, it is necessary to "hold" resources, but we shall show that a person may have a right to use a resource even though he does not hold it. We shall further indicate that it is only when we consider the holding of both real resources and pseudo-resources (including liabilities) that we have a complete view of the distribution of ownership.

The second survey will indicate the distribution of money's worth or purchasing power held at a moment of time. Such a survey differs from the survey of real resources in that it indicates, not the distribution of specific resources, but the distribution of "general power" or "general resources". The distribution of money's worth is a distribution of ownership, whereas the distribution of real resources is a distribution of holdings. The holdings of money and securities (including liabilities) act as a kind of link, connecting schemes of holdings and schemes of ownership and, we may say, making them identical. Some of the securities and liabilities represent the rights and duties to transfer real resources, and some represent the duties and rights to pay or receive money (a general resource) in the future; thus they make it possible for a person to hold "by proxy" what he will hold "physically" in the future, assuming contracts to be fulfilled.

This distribution of purchasing power is only of significance in a community which employs money as a medium of exchange, and even in such a community the "measuring rod of money" comes into direct contact with a part only of real resources<sup>1</sup>. In the majority of modern communities the proportion of such real resources to the whole is very considerable, and in many directions the volume is increasing. States have been extensively absorbed into the monetary system by their employment of money, and have even in many ways become little more than units co-ordinate with other units. On the other hand, their activities have resulted in the placing of many resources out of contact with the measuring rod of money, and it is doubtful if money's worth possessed by the State and local authorities can be reasonably nearly estimated.

In the third survey we shall consider the distribution of "well-being", which we shall identify with what is usually termed "satisfaction". There are economists who make this distribution of satisfaction the basis of their study, considering the factors that determine the maximization of a part of satisfaction which they call economic satisfaction.<sup>2</sup> This approach we shall condemn, on

<sup>1</sup> Pigou, A. C., *Econ. of Welfare*, chap. i.

<sup>2</sup> Pigou, A. C., *ibid*



the ground that there is no such thing as economic satisfaction distinguishable from satisfaction in general and, further, we shall condemn the conception of social satisfaction shared amongst units on the ground that satisfaction is subjective and therefore individual. We shall suggest a method of meeting the desire to speak of social satisfaction.

This survey will indicate the relationship of well-being to the pattern of living. Well-being or satisfaction is that which men pursue: the desire for it supplies, so to speak, the driving force in the business of living. On the other hand, in pursuing this general end, there are obstacles,<sup>1</sup> physical and social. The process of living is the process of discovering the resultant of these opposing forces or the condition of equilibrium.

Equilibrium of desires and resistances is made manifest in the "equilibrium" of material resources, or, more precisely, the equilibrium of a scheme of disposition of real resources. Desires change, resistances change, and, consequently, patterns of resources change. The change of desires brings consequential changes of resistance distribution, and changes of resistance distribution bring consequential changes of patterns regarded as most desirable.

The basic fact that this section is intended to reveal is that, in a scheme of living such as that experienced by modern communities, the conditions of equilibrium and disequilibrium are to be found partly in the *distribution of property* and partly in the *exercise of the rights of property*.

Perfect equilibrium is the perfect adjustment of means and ends and satisfaction is the term which we apply to the feeling associated with its existence or the approach thereto. The attainment of perfect equilibrium is only conceivable in a modern society if the patterns of living (*a*) are physically possible, (*b*) are financially possible, (*c*) give individual satisfaction, and (*d*) meet with social approval.

<sup>1</sup> Pareto, V, *Manuel d'Economie politique*.

## CHAPTER II

### THE PROPERTY STRUCTURE

To a person living in isolation the question of property does not arise. His mode of living is determined simply by his desires and the physical possibilities of fulfilling them known to him. When men live in proximity to one another or are interested in the same resources, the institution of property is, normally, developed: it is a social institution.<sup>1</sup>

The distribution of property is a distribution amongst men of freedom to use resources. When this distribution is effected men know what resources they can make use of without hindrance from others and the terms upon which they can make readjustments of these freedoms. It is an essential feature of a property distribution scheme that exchanges and gifts are voluntary or, in other words, the readjustments of property distribution are made or not made as decided by the property owners. It is a further implied condition of property that contracts shall be honoured. If gifts and exchanges are not free, if contracts are not fulfilled, there is no property distribution and freedom in administration does not exist in such a way as to make possible an equilibrium of desires and possibilities.<sup>2</sup>

It is the possibility (or existence) of conflicting or incompatible desires with respect to the same resources that calls for the determination of property. The removal of this incompatibility is the determination of property. From this it follows that the primary process of determining property is the process of discovering the distribution of power, backed by the will to express it. The freedoms which men enjoy are, then, freedoms which can be defended (or asserted) or, in other words, they are the freedoms which they enjoy within an equilibrium of power.<sup>3</sup>

Since economics is the study of man in the administration of material resources, and since administration of resources involves the putting of these resources in their "right" juxtapositions, it follows that the process of distributing property is a process of interest to the economist. This is recognized by all economists, for the topic which all discuss without exception is the matter of

<sup>1</sup> Hume, D., *op cit*, vol. II, pp 179-181

<sup>2</sup> Mises, L. von, *Econ. Calculation*, *op. cit*

<sup>3</sup> Commons, J. R., *Institution Economics*, *Amer Econ Review*, 1931, and *Institutional Economics*.

exchange, which is a process of voluntary adjustment of property rights. But the field of interest of the economist must stretch beyond this interest in exchange, and include the process of equilibrating *power*. This primary distribution of all is the first essential of a co-ordinated scheme of individual administrations or individual patterns of living

Economists, usually, *assume* a given distribution of property<sup>1</sup> and then proceed to discuss the principles of individual administration within this scheme, including the principles of voluntary adjustment of property rights which these individual administrations involve. If, however, we take a step further behind this assumption, it will be seen that we need only make an assumption of asserted or individually claimed freedoms. This places the process of power equilibration within the ambit of study and shows that it itself is determined by men actuated by the same motives and operating on the same principles as those which actuate and operate respectively within the field of liberty defined by property rights. When men exchange voluntarily, they create positions of mutual advantage: if they seek to determine their respective liberties by conflict, they create situations of mutual disadvantage. In both cases, however, they administer resources, making substitutional changes directed towards what they regard as the best patterns of resources.

The process of power equilibration, or the process of primary property distribution, is dealt with more fully in the last section of this book. In the first four sections we are concerned chiefly with the field of administration usually covered by economists. We assume, therefore, in our first examination of the economic system or structure, that the primary distribution of property has already taken place. We cannot, however, in this section and the next, do as we wish to do, present a picture of the ordinary socio-economic system, without placing therein the institution called the State, whose characteristic function is the expression of the power equilibrium. We shall, therefore, in those sections, assume the State's existence and attach to it the power of physical supremacy or sovereignty, sometimes operating within the system as a unit with given property and sometimes exercising its sovereign power to redistribute property.

The first point to observe in surveying the distribution of freedom or control over resources in the socio-economic system is that, though we find vast fields of control exercised by groups or institutions, liberty is a condition of individual persons. It is felt and exercised by particular individuals. As it is "felt" it is an experience, and as an

<sup>1</sup> Robbins, L., op. cit., pp. 127 et seq

experience it is individual, personal, subjective. As it is exercised, it is exercised by individual men, for it is individuals alone who can move things according to desire, and all human activities are individual activities. Fundamentally, then, the freedoms we call property rights are freedoms of individuals. They may be defined in various ways, exercised according to regulations involving activities of others in groups, but these limitations do not change the basic fact that, ultimately, freedoms are individual freedoms and all "group administration" of resources is a co-ordination of individual administrations.

The legal conception of a *persona ficta* is a recognition of this fact. When the property rights of corporations, societies and organizations of men in general are under consideration, these groups are endowed with a "fictitious" personality. As an association has "no soul to save, no body to beat", the souls and bodies are individual possessions. The conception of "group rights and duties" is a convenience: they are peculiarly defined individual rights and duties<sup>1</sup>

There is, obviously, a difference between my "ownership" of my hat and my "ownership" of the tramways belonging to the corporation of which I am a member. I can do pretty well what I like with my hat—or, rather, other people have no right to use my hat without my permission. I cannot, however, decide whether "my" trams shall run on Sundays, except through consultation and a specially defined course of procedure in co-operation with other members of the corporation. The trams are group property and my hat is individual property, but in so far as I have a voice in determining what shall be done with the corporation property I have certain individual rights connected therewith.

So with the shareholder of a company: he cannot dispose of part of the resources held by the company on the ground that it is his share of the resources, without co-operation with other shareholders. The property is the property of the company. And yet, here, as in corporation property, the individual shareholder has his rights and the exercise of the rights of the company is the co-ordinated exercise of individual shareholders' rights.

It is of the nature of group property that the individuals composing the group have certain rights as members of the group, and these rights are freedoms to help in making "group decisions". If I cannot vote in a municipal election, I am not a member of the

<sup>1</sup> "Persons, according to the dogmatic summary of Coke, are of two sorts, persons natural, created of God, and persons incorporate or politique, created by the policy of man (and, therefore, are they called bodies politique)," Carr, C. T., *Law of Corporations*, p. 14, quoted from Pollock and Matland, *History of English Law*, 1, p. 488.

corporation ; if a shareholder cannot vote at shareholders' meetings, he is not a member of the owning group.

With this fundamental idea in mind we can use the conception of group rights and duties, group freedoms and unfreedoms, the conception of a *persona ficta* is useful to the economist as it is to the lawyer. It is important, however, that the conception, of group rights as resolvable ultimately into individual rights, should be borne in mind, for some of the great problems of social administration depend for their solution upon an understanding of it. Since all group rights are ultimately individual rights, it is clear that all group valuations are ultimately individual valuations, and so-called "social values" of resources are always determined by the equilibration of individual valuations.<sup>1</sup>

The number of groups composing a community is legion : it coincides with the number of cases in which two or more persons have common interests. They vary in clearness of definition from those societies which have registered names and numbers to the vaguest of classes and racial groups. But, whenever a group exists, it has, as a necessary adjunct, its measure of property, of freedom to use resources, sometimes declared by law, sometimes assigned by the individuals composing it, their membership of the group implying a willingness to allow their resources to be used towards common ends.

It is impossible to specify all groups, but there is a value to the economist in seeing the social structure as consisting chiefly of individuals acting in family groups, in voluntary societies, businesses (special forms of voluntary society), and as a community embracing all and acting through the State. Consideration of these groups reveals the typical modes of administration in the community.

A "perfect" group, from the economic point of view, is one in which there is perfect agreement with respect to the dispositions of resources. In such a group every substitution desired by one person, in the scheme of physically (or commercially) possible substitutions, would be desired by every other person, and it would be made to every person's satisfaction. In business administration, where the most satisfactory result of the group's decisions is measured in

<sup>1</sup> "It is needless to say that a corporation can be represented and can act only by real persons. Its representatives will almost invariably be an appointed committee of members, its president and secretary, its board of directors, or its mayor and aldermen. Those who act for it will be (i) its representatives, its governing body, and (ii) for the purpose of transacting details of daily business, certain other persons appointed as agents. The extent to which the representatives can represent the corporation, and the extent to which the agents can act on its behalf, will be determined in the first place by the terms under which the body was incorporated, and in the second place by some agreement between the incorporators." Carr, C. T., *Law of Corporations*, p. 99.

money values, frequently very accurately calculable, such unanimity can frequently be obtained by discussion of objective data. In family administration, the standards of values are frequently so nearly identical that the "group decisions" are identical with individual decisions. In most groups, however, though there may be considerable unanimity with regard to ends pursued, there is a more or less extensive amount of possible disagreement and, in such cases, decisions are arrived at by a process of "give and take" (bargaining) or by a process of equilibrating power. The convention of majority rule is an acceptance of the principle of decision by balance of power. Some forms of leadership should, properly speaking, be regarded as exercises of power, for those who are led are frequently not to be regarded as making rational judgments and, therefore, they do not make administrative decisions.

The administration of resources by a group in the pursuit of group ends is a field of study which has been called "institutional economics".<sup>1</sup> It is a part of the study in which much remains yet to be done. In this book we shall not discuss the problems in much detail, most of what we have to say being placed in the last section of the book,<sup>2</sup> where the administration of resources by the "imperfect group" called the community, through the State institution, is considered. In the rest of the book we shall assume that the internal "equilibration of desires" with respect to ends and, therefore, the establishment of a group scale of values, have been effected. Families, businesses, and other societies, except the community itself, will be assumed to speak with a single voice as if speaking with a single mind.

Having directed our attention to what we may regard as the personal aspect of the social pattern or structure of control, we must now consider the distribution of the things controlled. In common speech we usually employ the word "property" as denoting the resources, the accepted freedoms to use which constitute the rights of property. Thus we speak of real property and personal property, the distinction being based on the character of the things possessed, and we speak of house property, property in securities, money, etc. The distribution of property in this sense is the distribution of resources amongst the controlling units to which we have referred above.

Before we discuss this distribution it is necessary to note the kinds of resources which men administer. We have said, at the beginning of this book, that these are material resources; we must, however, elucidate. By using the term "material" we do not wish to

<sup>1</sup> Commons, J. R., *op. cit.*

<sup>2</sup> See also Appendix

raise any philosophical issues. We use it, merely as the ordinary man uses it, to denote what he would call "things"—physical things, including what he ordinarily thinks of as energies. In this category, we place land and resources made from land, things that grow on the land (plants and animals), water, air, etc., and, finally, man himself—they all occupy space.

In countries where slavery is not permitted men are not allowed property in other men but, from the economic point of view, they are allowed property in themselves. Lawyers speak of property rights as rights to use resources external to man, and the rights of a person to use himself they call personal rights<sup>1</sup>. But from the economic point of view personal rights are property rights—they are socially recognized freedoms of men to employ themselves. The distinction between personal rights and property rights has no economic significance; they are both, for our purpose, property rights.

We insist on the use of the word "material" in order to overcome a confusion that creeps into economic discussion between what we ordinarily regard as "things" and the "qualities of things". Again, we do not wish to raise philosophical issues. "things" may be merely "bundles of qualities" but clear thought requires consistency, and it is confusing to regard as resources things *and* their qualities. We may, for some purposes, prefer to speak of qualities and, for other purposes, of the things, but we cannot, for one purpose, use the words indiscriminately as denoting identicals. We must discuss things *or* their qualities when we are considering pattern making, and it is obviously better to concentrate on the things—or the "*bundles of qualities*".<sup>2</sup>

Some authorities, for example, speak of knowledge, skill, wisdom, judgment, etc., as resources; some include moral qualities of grit, courage, perseverance, etc.<sup>3</sup> From our point of view, we speak of knowing men, skilful men, wise men, judicious men, moral and

<sup>1</sup> "Personal Rights consist of two principal or primary articles, the right of *Personal Security*, and the right of *Personal Liberty*

"I The right of Personal Security consists in a person's legal and uninterrupted enjoyment of his life and limbs, and of his body, health, and reputation" p. 143

"II Personal liberty consists in the power of locomotion, of changing situation, or moving one's person about to whatsoever place one's own inclination may direct, without imprisonment, hindrance, or restraint, unless by due course of law" p. 149

"The rights of property consist in a man's free use, enjoyment, and disposal, according to the laws of the community, of all his acquisitions in the external things around him" p. 156 *Stephen's Commentaries*, 11th ed., vol. 1

<sup>2</sup> Fisher, Irving, *Elem. Princ. of Econ.*, pp. 3, 13, 26

<sup>3</sup> Marshall, A., *Principles of Economics*, pp. 55–7.

immoral, courageous and persevering men. The terms used above are terms denoting *qualities*—of *men*. It is sometimes said of knowledge that it lies in books: from our point of view it does not. Knowledge “resides” in human “minds”—that is, men *know*. Books are material things with certain marks on their pages, a perusal of which, by some people, makes them “knowing men”, men who know.

One of the commonest mistakes which the employment of the word “material” makes impossible is the conception of economics as the study of man in the production, consumption, distribution, and exchange of goods *and* services. Goods and services are not *correlatives*<sup>1</sup>. Goods are things that serve and services must be interpreted as relationships (or satisfactions). The distinction is made, usually, between goods, as things external to themselves which men may sell to each other, and services, as the “things” which professional men, for instance, sell, “things” such as skill, advice, sermons, lectures.

The real correlatives are goods and men, or the services of goods and the services of men. By considering men as material resources we avoid the confusion and see that what we are concerned with in our economic activity is the establishment of certain physical *juxtapositions* of them: they give us satisfaction through the contemplation of them in relation to one another, and, therefore, they serve in the scheme or pattern.

The employment of the term “material resources” also involves our rejection as resources of two “factors” which many economists have in recent years included, namely, “organization” and “risk-bearing”. Organization is a system of relationships but the relationships exist among things and men. We may control groups of resources which have certain qualities or habits and exist in certain physical relationships to one another, and we may speak of *an* organization as a resource, but we cannot speak of “organization” *per se* as a resource. And ability to bear risks is also a quality: some men take risks and some do not, but they are most properly described as risk-bearing men or non-risk-bearing men. Organizing and risk-bearing are parts of the process of administration or, strictly, are the administration process itself.<sup>2</sup>

<sup>1</sup> Fisher, Irving, *Nature of Capital and Income*, ch. vii, pp. 101–118.

<sup>2</sup> (a) So also is “waiting”. See Marshall, A., *Princ of Econ*, p. 233, 7th ed. Marshall says that accumulation is generally the result of “waiting” or “in other words, again it is dependent on man’s prospectiveness”. “Waiting” is a mode of behaviour or a mode of administration, it is not a resource. “Prospectiveness” is a quality of man which may cause him to wait or not to wait, to save or to spend.

(b) For the distinction between *risk* and *uncertainty* see Knight, F. H., *Risk, Uncertainty, and Profit*. See also Pigou, A. C., *Economics of Welfare*,



There is one form of resource administered by men which it is difficult to regard as a material resource at times, though at others it may be possible, but even when it is material its materiality has no significance in man's administration like that of bread, for instance. We refer, of course, to *money*.

In an ordinary exchange society money is employed as a resource by individuals, though its usefulness is only indirect as giving power, within a pricing system, to administer material resources. Men's "property" usually includes a certain amount of this medium of exchange and, though sometimes it is of metal or some other material, it is frequently nothing more than figures in the books of a bank. The function of money is to aid in the administration of material resources and not to be administered itself as an ultimate end. This resource, because it does not fall into the category of material resources, we propose to call a *pseudo-resource*, to distinguish it from the *real* or material resources.

Though money has been represented as a "claim on resources", we cannot reject it as a resource because, at any given moment, the resources being actually administered consist of those on which these "claims" may exist *plus* the amount of money which people hold. It is, then, an addition to the stock of things which are available for use, though it is only of indirect use.

There is another kind of pseudo-resource, however, which does

Appendix 1, p. 915. "Let us imagine," says Professor Pigou, "a man in possession of a vase, which, as a vase, is worth £100, but, if broken, would be worth nothing, and let us suppose the owner to know that this vase contains something, whose value is equally likely to be anything between nothing and £250. If the owner breaks the vase, he is, then, equally likely to lose any sum up to £100, or to gain any sum up to £150. The actuarial value of his chance is, therefore, £25, and, if there were a million people in his position, and they all elected to break their vases, the aggregate wealth of them all would be increased by about £25,000,000. In other words, the services of these million people, in bearing the uncertainty of placing £100 each in a position where it is equally likely to become anything between nothing and £250, are responsible for an addition of £25,000,000 to national wealth." The interpretation of this case to us seems to be, not that there is a *factor of uncertainty bearing*, but rather that (i) the "productivity" should be attributed to the labour and resources used in breaking the vases because the million broken vases are worth more (through their contents) than the million unbroken vases, (ii) uncertainty is a circumstance upon which actuarial value is calculated. It causes men to discount possibilities but when uncertainty is discounted "certainty" remains. In his *Economics of Stationary States*, p. 26, published since the above was written, Professor Pigou now considers that "it is more convenient, however, to regard such elements as 'waiting' and 'uncertainty-bearing' as *sources* of factors of production than as factors themselves."

(c) A new suggestion is that *time* should be regarded as an economic good—and, therefore, as a resource. See Rosenstein-Rodan, P. N. "The Role of Time in Economic Theory," *Economica*, Feb., 1934, pp. 84-8. On this, see below, p. 268, where we attempt to show that time, like space, is a dimension of goods. See Pigou, A. C., *Econ. of Welfare*, p. 916.

constitute a claim on resources (*real* resources and the pseudo-resource, money), namely *securities*. Along with securities should be classified licences, copyrights, patents, etc., and all other documentary proofs of property rights. These documents are evidence of rights to use money or real resources (specified or unspecified), and they are included along with these other resources as property, of individuals or groups. In a complete survey of resources, then, securities should be included.

Now the fact is that it is impossible to take real resources and "divide" them into units or groups, assigning them as property units to certain property owners. Joint ownerships, mortgage claims, debenture claims, reversionary rights, etc., are cases in which this impossibility is obvious. It is only possible to give precise descriptions of resources *held* by groups or individuals, and the inclusion of *pseudo-resources* as described above, along with *real* resources, in the category of resources used by men, makes possible a survey of *holdings* which shows the distribution of *ownerships*. And along with the securities as pseudo-resources must be included the proofs of *liabilities*.

To some readers this classification and identification of resources may seem somewhat fantastic. It is, however, necessary if a survey of "resources" is to be regarded as a survey of "properties" in terms of resources and not money values.

Property really, however, does not consist of resources at all. It is the right to use resources: it is a socially recognized freedom. Strictly speaking, then, it is impossible to make a total of property held in a community and it is impossible to show its distribution. Liberty cannot be measured. We can only measure or enumerate things, and if a survey of property is required a survey of things which may be regarded as *evidence of property* is the only course open. But things can only be used or held (and in order to use them they must be held), so if we are to survey the possession of rights to use things we must survey all *things* that are held as evidence of these rights. The holdings of real resources, money, securities, evidence of liability, are evidences of rights and their limitations, and these can be surveyed.

The conception of "holding" is a conception of a physical relationship between men and things. The holding of securities is a means of holding *now*, by "proxy", what *must be held* when the *future* freedoms, which the securities represent, are actually enjoyed. The "holding" of liabilities is a present means of "not holding" future freedoms, which present holdings would *prima facie* suggest that a person will hold.<sup>1</sup>

<sup>1</sup> Ownership is essentially prospective; holding is essentially immediate.

We have said that a survey of property rights or freedoms is impossible since liberties cannot be added or even measured. In making a survey of holdings of real resources and pseudo-resources it is also impossible to make a total of all that are held in a society, or even by an individual for the similar reason that we cannot make a total of dissimilar things. A plough and a cow and a pound note are three things, but this numerical expression has no significance. All that can be done is to make an inventory. This inventory should include all real resources held by individuals or groups, all money, all securities and all documents showing liabilities. If every individual and group gave all these data, the whole would be surveyed. there would be no double-counting for there could be no counting at all except of the things that are similar. It would not be a survey of "property owned"; it would be one of "resources held", but this would be a survey of "evidences of ownerships".<sup>1</sup>

<sup>1</sup> Cf. the legal conceptions of *ownership* and *possession*. "The essence of ownership, then, is that it is a right or an aggregate of rights. Possession, on the other hand, is primarily a matter of fact" p. 116. "Possession . . . involves some actual power of control over the thing possessed," p. 117, Geldart, W. M., *Elements of English Law*

### CHAPTER III

#### DISTRIBUTION OF MONEY VALUES

Though, in a barter system, every property right that is transferable may be valued in terms of another right, it is not until there is a single standard of reference, that is, a single property right to which every other may be compared, that all ratios of exchange, or prices, can be directly compared. This single standard of reference is the property right in *money*, "the measuring rod of value."

The money *price* of a commodity or service is the *ratio* between the quantity of money and the quantity of the commodity or service exchanged against it; it always expresses, therefore, the amount of money exchanged *per unit* of the commodity. Thus, if 3 lb. of butter are exchanged against 6s., the price of butter in this transaction is 2s. *per lb*. The money *value* of a quantity of a commodity or service is not, however, a ratio: it is an *absolute amount*. If butter is 2s. a lb. (this is its price), the value of 1 lb. is 2s., of 2 lb. it is 4s., and so on; it is an amount of money. In a money-using society it is possible to state the value of every quantity of every exchangeable commodity in terms of money.

This possibility, of considering property rights as exchangeable for money, means, then, that we can conceive of a *total money value* held by a person. We can add together the value of the property he has in his house, the value of the property he has in food, in labour, and in all things, and this total value is an *amount of money*; it is not a sum of prices, it is a sum of money which can be raised by the sale of properties. As we have seen in our previous chapters, it is impossible to conceive of a total amount of rights of property, or a total of liberty or freedom to use resources, or even a total of the resources themselves or other evidences of property rights, but, by *valuing* property rights in terms of money, it is possible to make a total; all property rights are reduced to so many units of money.

Not only can the total value of an individual's property be computed in this way, but a total of the money value possessed by a group of individuals may also be reckoned: that is, a "social total" is possible. There are almost insuperable difficulties in the process, and it is better, perhaps, on the whole, to say that the total is simply "conceivable", possible in the mind though not in figures on paper. The difficulties are not, however, such as destroy the

existence of such a quantity, any more than the difficulty of measuring the distance of a star implies that there is no distance to measure

Not all freedoms to use resources are transferable and, consequently, not all freedoms are valued, ordinarily, in terms of money. A survey of the values held, then, at any moment, would not usually include a valuation of all freedoms or rights. Many of the rights regarded as political—freedom of speech, freedom of person, etc.—are not capable of reduction to market price because there is no market for them, and many things such as heirlooms, which people prize for purely personal reasons, have little or no value in exchange; but though they are not, in practice, valued in money, it is conceivable that they might be.

Once a total of this kind is conceived it is inevitable that attempts will be made to measure it and, further, inevitable that a great deal of attention will be paid to an analysis of its distribution and the causes that determine its distribution. It will seem to some that here we have a total which is "shared" amongst the members of the community, if anything is wrong with its distribution it can be redistributed and so allocated that it will be fair; if the average share is not large enough for our desires we can consider ways and means of increasing the total and so increasing the average holding. It is a total that is capable of being handled by quantitative analysis; mathematical methods can be applied to its examination, and we have something that can be treated scientifically. Much of this is true; much of the progress of economic science is due to the possibility of reducing liberties to use resources to such a "quantity", but many false conclusions have been drawn and much nonsense has been spoken and written because the real meaning of the figure produced in such surveys has not been clearly grasped.

Broadly speaking, it may be said that the good work that has been done in the employment of the figures in these surveys has been done by way of explaining the distribution of money value, by those who have taken the pattern of its distribution as one manifestation of the pattern of living; the nonsense has been uttered by those who think of the total as a quantity of wealth or a quantity of freedom to use resources. Especially useless is that conception of the total which leads people to speak of it as a "cake" shared amongst the population

There are two ways of presenting, statistically, the results of a money value survey of a society, and both of them may be mis-handled if the significance of the figures is not fully appreciated. The first mode of presentation is as a total money value possessed

by all members of the community together ; the total may be given alone or it may be given in relation to the total population or the number of families, thus giving an " average " money value held per head or per family . The second mode of presentation is in the form of a frequency table, showing the number of persons (or families) owning money values of given magnitudes . Thus, the results of a single survey may be presented as, say, £20,000,000,000 in a community of 50,000,000 persons, or 10,000,000 families, giving £400 per head or £2,000 per family , or they may be presented as 4,000,000 families possessing values ranging from 0 to £100, 2,000,000 in the group £100 to £200, and so on, income grade after income grade.<sup>1</sup>

The first point to observe is that money value held by an individual represents purchasing power (or selling power, which, when realized, becomes purchasing power). Purchasing power measures the power of purchasing in a market with a given price scheme , it is a measure of power over property rights which are already priced. The price scheme itself depends upon the distribution of property rights . therefore, the total value depends upon the distribution. If this distribution of property is changed, the price scheme changes at once and the total value changes. We may illustrate by reference to a particular case

At the present moment there is in existence a certain distribution of property in houses. If a decree were issued that all tenants were to become owners of their houses—that is, a compulsory redistribution were made—the prices of houses would instantly change . The simple redistribution of house ownership would alter the total value of all houses, though houses were not altered in number or occupation.

This is surely an important quality of a total . It seems natural to think of a total as something that consists of parts and as something that can be divided into variously sized parts without affecting its magnitude, but we have here an exception to this rule. The total money value at any moment depends upon its distribution. Those who speak of the average value held as £*x* per head and, therefore, suggest that justice demands that all should be given this average, in the expectation that everybody would receive it, indulge in a vain hope. The redistribution would alter the average value held, and no statistician can estimate what the new average would be. Those who condemn the distribution of the total on the ground that

<sup>1</sup> It should be noted that we are here considering " capital value " distribution . This is necessarily so *at a moment of time* . For methods of presentation see Stamp, Sir J C , *British Incomes and Property* , Bowley, A L , *Division of Product of Industry* ; Clark, Colin, *The National Income, 1924-31* , Bowley, A L , and Stamp, J C , *The National Income, 1924*

the average would represent too low a standard make the same false assumption<sup>1</sup>

The second point is connected with this. Since the total at any moment depends upon the price scheme at that moment, it follows that a comparison of two totals collected at two different times is impossible if the price scheme has changed. Some writers—a large number, in fact, of economists—have suggested that changes in the price scheme can be measured. They conceive of the price scheme as a “surface” of varying levels and any change in the scheme is, therefore, a change in this contour distribution; a measure of the average change of prices is, then, a measure of the change of *level*. An index number showing the level of prices will, it is suggested, enable a “correction” to be applied that will make possible a comparison of the “real” values or of the “real” totals at two different times. If the index number shows that prices have, on the average, doubled in ten years (the price level has risen 100 per cent), then the total value at the end of the ten years can be halved and placed beside the total value at the beginning of the decade for comparison. This conception of the price scheme is, however, an inadequate one, and it has been replaced in recent years by the conception of a price *structure*<sup>2</sup>. The conception of price structure takes cognizance of the fact that price ratios may change, and the total values may change, in such a way that the price “level” remains stationary. Though total values will, in all probability, change if the price level changes, yet there is no necessary ascertainable quantitative relationship between the two. We shall consider the problem at a later stage, but the basic fact must be predicated here that changes in total values are not to be regarded as measures of changes in total property rights enjoyed in a community.

Both of these points indicate that the figure representing the total purchasing power of an individual or a community has no absolute significance, but that it derives its significance from the price scheme. It remains to consider what real significance there is in the distribution of relative amounts of purchasing power held by individuals in the community.

It would seem that in the *distribution* of the values possessed we have something that is independent of the price scheme. If a person has £1,000 he has twice as much purchasing power as one with £500, and, if these two persons remain relatively in the same

<sup>1</sup> Bowley, A. L., *op cit*, pp 20–1, for the significance of the average pp 57–8 seem to some extent to illustrate the dangers referred to in the text. Bowley, A. L., *The Measurement of Social Phenomena*, pp 207–8.

<sup>2</sup> (1) See Hayek, F. A. von, *Monetary Theory and the Trade Cycle*, ch. III.  
(2) See Keynes, J. M., *A Treatise on Money*, vol 1, bk. II, especially ch. 7.

position through a period of changing prices, it would seem reasonable to assume that one remains twice as well off as the other throughout. And so he does, in purchasing power, but we must be careful in our interpretation of the situation.

A person who possesses, as his grand total of realizable assets, a value of £100 may be said to have a purchasing power that will enable him to buy a motor-car priced at £100, or twenty suits at £5 each, or 40,000 loaves at 6*d* each. That is what we may describe as a nominal fact. In reality, however, he will not buy those loaves nor can he, rationally, buy the car. The matters of necessities and desires enter at this juncture. Though he could buy the motor-car, he would not be able to use it, since he would have nothing left for food, and though he could buy 40,000 loaves he ordinarily would not. The real significance of money value possessed lies in the pattern of living he can acquire with it, and we cannot say that "well-offness" or welfare is proportional to income.

Thus we arrive at the conclusion that the total value possessed by an individual or a community and the distribution of the amounts of value held by individual units in the community are just what they are—totals of purchasing power and distributions of purchasing power at the moment—and nothing more. They derive their significance solely from the fact that the distribution of purchasing power at any moment, in conjunction with the price scheme at that moment, is definitely related to the pattern of forces determining the disposition of material resources. This conclusion is of fundamental importance and the importance will be realized when we proceed to show in some detail the nature of the survey that we are discussing.

In making a survey the first essential is to define precisely that which we wish to survey. Here we are concerned with the survey of the distribution of purchasing power among members of the community. This means that we wish to know the amount of money which every unit can *raise* at a given moment. Most units hold a certain amount of cash or money in the banks and this, of course, must be recorded at once. In addition, however, most units hold resources of other kinds representing their freedom to use them and these must be valued. Debts, however, must be deducted if they are due to be paid immediately, for these do not represent value which the units have at their disposal. The money value we wish to record is, then, the *net money* that the members of the community can raise.

It must be observed that the values we are considering are not those which would appear if every unit actually tried to realize its assets *at once*, for such a procedure is, in fact, impossible, and the



impossibility is not due to the disturbance of prices that occurs when more extensive sales than usual are attempted, but to the more fundamental fact that all property rights cannot be disposed of simultaneously by all members of the community, since selling implies buying and universal selling implies universal buying. The position considered is the *ordinary position at any moment*, and the return that every unit makes must be a return of its estimates of what it could raise if it proceeded to realize everything realizable, in a market which functions ordinarily

The mode of estimating the net money value, which a unit can raise at any moment, can best be studied by considering, first, the case of an individual. If a person is called upon to give a return of his position in this respect, the first thing he will note is the amount of money he has in his pocket or till and the amount he has in the bank on which he can draw cheques. Some economists, in reckoning the wealth of a community, exclude this. They argue that since money, as money, has no direct satisfaction-giving power, in the sense that bread may be said to possess it, it should be excluded. From an individual point of view, it is, of course, absurd to exclude money and, we suggest, from a social point of view it is equally absurd if we are to consider the distribution of purchasing power as of significance in the business of pattern making. The pattern of material resources produced by a community is, in a monetary exchange system, determined partly by the distribution of money, and it would be fatal to exclude it.

In the second place the individual person will consider the value of his *material possessions*, what we have called his "holdings" of material resources. The values that attach to these "evidences of rights to use" are not so easy to estimate as would at first sight appear. A person has, say, a dining-table and a dozen chairs, they may be valued separately or "in sets". The value it would seem more appropriate to return is the greater one. Resources "in sets" are obvious cases in which a choice of valuations must be made, but a question always arises concerning what shall be regarded as a "set". The whole of a house, furniture, and garden might conceivably be regarded as a "unit" of saleable property. There is nothing we can say here, however, that will help in deciding these cases except that the resources must be valued separately or in sets so that the greatest total is made.<sup>1</sup>

Thirdly, the person making his return will consider the value of the *securities* he holds. These may be stock and share certificates,

<sup>1</sup> The value of a business as a "going concern" compared with the total value of the separate assets is another case in point, and its significance is shown below in pp 95-6.

the scrip of government or municipal loans, bills of exchange, mortgage deeds, and so on. Such securities have a money value easily established as a rule and give little trouble

We now come, however, to difficulties that have caused economists considerable exercise of mind. We have included in the returns for our individual his money, material resources, and securities, but it is common knowledge that a person may be able to raise a certain amount of credit. If he has to deposit some of his securities in order to obtain a loan this power of raising money is already accounted for. If, however, he can keep his money, securities, and material resources and obtain credit by giving an undertaking to pay interest and principal in the future, then he has a power of raising money which must be included. This credit raising power must be regarded as something emanating from himself, and it is an indication of how a person may value the property which he possesses in himself. We may describe the situation by saying that we include in the money value possessed the amount of *money he can raise by the issue of new securities* based on the extent to which his bond inspires confidence in the market.

The issue of a new security in this way is the acceptance of a new liability in the future, the value of the security depends upon the nature of the promise and the certainty of expectation that can be aroused in the creditor. The capacity to raise this money is sometimes described as goodwill, but goodwill must be interpreted as something more than a quality of character; it must be coupled with a capacity (or a power of persuading others of the possession of the capacity) to produce the payments in the future. The capacity to provide future payments may depend upon the possession of the means to employ and the money borrowed on security of this kind may provide the means to enable the borrower to meet the future commitments.

We have now completed the survey of the contents of a person's present control of purchasing power. It is the sum of his money in hand and at the bank, his securities held, his material resources (separately or groupally valued), and the money he can raise by the issue of securities on goodwill—if not already issued and so standing as cash in hand. It is necessary now to consider the question of debts and liabilities.

It must be remembered that we are estimating the amount of money value which a person holds at any moment. Any debts (in money value) due for payment at that moment must clearly be deducted from the value over which he has control and any debts due to him at that moment—due for *immediate payment*,

that is—must be added. The former amount is not his and the latter is. But the liabilities to pay sums in the future are not immediate liabilities and these must not be deducted.

This statement will sound strange perhaps to those who are acquainted with surveys of capital possessions or wealth owned. It is usually argued that if a person has undertaken some liability there should be deducted from his possessions the present value of that liability<sup>1</sup>. This would be perfectly correct in the case of a person's estate being wound up after death, but in the case of a person who is a "going concern" it is incorrect. If I have borrowed £1,000 on a promise to pay interest and capital in annual sums I possess at this moment this amount of money. It is part of the resources from which I shall produce the future payments. I have the money and I can spend it.

The person from whom I have borrowed the money has a security which he may be able to sell in the market. The value which he can obtain for it is part of his money value possessed. It would seem, therefore, to suggest that we are here "double counting". We are reckoning money in my hands borrowed from another person as my possessions, and the security as money value possessed by the lender.

The difficulty arises, however, only because the practice has developed of trying to make the purchasing power possessed by individuals represent in some way or other the *material things* which they employ in living but the sum of purchasing power is not identical with the sum of material things. Further we must rid our minds completely of the notion that we must add together the purchasing powers of individuals as if we were winding up all their affairs and realize that we are only trying to see how, in a "going world", purchasing power is actually distributed at a moment. Then the difficulty disappears.

The consideration of a business owned by shareholders makes the position clear. The balance-sheet of a business always shows the business as possessing nothing. It is "possessed". All that a company holds is owned by the shareholders. Thus it would seem that in a survey such as we are considering no data need be collected from such organizations. The securities held by shareholders of a railway company, say, represent the railway; to reckon the securities *and* the railway would seem to suggest double counting. But in actual fact the shareholders hold securities that they can sell or lend and the company has the resources which it can sell or lend at any given moment. The company can also raise money on its goodwill.

<sup>1</sup> Marshall, A., *op. cit.*, p. 56.

The same argument applies to the State. Those who survey the "wealth" of a State in money values estimate the money value of all material resources and securities held, including all cash in hand, and then deduct the "national debt"<sup>1</sup> The fact is, however, that the State can use its resources, securities, and money held, and the holders of government securities can use these securities at the same moment. The liability to pay interest a year hence is not an immediate liability and in the meantime the borrowed money can be used. The State must not, therefore, in calculating its immediate control of money value, deduct its liabilities, it should, in fact, add all the further liabilities which it can incur, its unused borrowing power.

It may be said that the State raises further liabilities by earmarking taxes for the service of the loan (except in the case of "productive" loans), and that these taxes affect the distribution of purchasing power among the taxpayers. This is true, in a sense, but we are here considering what immediate purchasing power the State can be regarded as possessing. The redistribution does not take place till the taxes are raised, so, in the meantime, the State has power to raise loans which it may or may not use and the taxpayers have the money which would be so loaned or taxed.

In addition to the power of raising loans on the security of taxes, the State can, at any moment, be regarded as possessing power to raise cash by taxation. It would seem that in this case there is an inevitable amount of double counting, it may be said that we cannot include the taxes which the government can raise and allow the possessions of the tax-payers to be unaffected. Thus, if the government has a reserve taxing power of 100 million pounds, this amount should be deducted from the money value possessed by the tax-payers.

This also is to misapprehend the situation. The fact is that the tax-payers have the money and the government has the power to raise the taxes; the State can raise *taxes* now and can borrow now on the strength of *future taxes*. That both State and tax-payer have, at the moment, these rights, is a fact of great significance. It means that the pattern-making possibilities of the situation are different from those which would exist if the State had no power to raise the money.

Besides taxing and borrowing the State has a further power of raising cash at any moment; we refer to the power of issuing new legal tender. It is a method commonly employed in times of stress. It is difficult to state how much new money a government can print at any moment; it is conceivable that it might issue

<sup>1</sup> Marshall, A, op cit, p. 59.

sufficient to buy out every property right held in the community and capable of being sold, but it is doubtful if the measure of its power could be regarded as this.

There is one business organization which possesses a power which is often regarded as of similar significance to these cash-raising powers of the State : this organization is the banking system. Banks hold money which belongs to their clients but their organization is such that they can cause this deposited money to "increase in quantity" ; the reserves of money necessary to meet their obligations to their customers are less than the amounts deposited and this gives them the power to relend some of it. The banks therefore, at any moment, may have a power of increasing the loans they have already made and this reserve of unlent purchasing power is an asset which should be included in the survey of money values which can be raised, or of immediate purchasing power possessed<sup>1</sup>

We may now conveniently summarize the position as seen by the present writer. The money value possessed at any given moment by any unit, or, in other words, the purchasing power in the hands of any unit, consists of the following items :

1. Money held in hand or at the bank, available at once.
2. The money value of all rights to use specific resources held separately, or in groups, whichever is the greater.
3. The money value of all rights defined in securities held.
4. The unexercised borrowing power, represented by the securities that the unit can issue to obtain loans

In addition, we have the special case of banks, which can increase their lending and so must reckon the unexercised power of lending as part of their present power, and the State, which has taxing power, borrowing power, and the power of issuing new legal tender cash.

Any complete survey of the distribution of money value possessed in a community at any moment must use figures obtained by the means indicated. The *total* is a figure of no significance. Money value possessed is purchasing power possessed, and this is a measure of control. The study of economics as the study of pattern making requires as a necessary basis a knowledge of this distribution of power to make patterns

No complete survey of the distribution of property values has ever been made, though many partial ones are available. The chief

<sup>1</sup> This reserve is never entered in the books of account in any way. It is of the nature of an undeclared hoard - it is the "hoard" on which banks "draw" when they increase their credits. Cf Hayek, F. A. von, on "Elastic Currency", *Prices and Production* and *Monetary Theory and the Trade Cycle*

of these surveys are (1) distribution of incomes amongst individuals and families, (2) distribution of capital value possessions, (3) "sizes" of businesses. The last distribution is not usually regarded as comparable with the others, but we hope that this chapter has demonstrated the comparability. The "size" of a business is only capable of this kind of measurement—by capital value or annual turnover or profit—physical sizes cannot be estimated except in terms of an arbitrarily chosen dimension.

All surveys show a common feature which it is part of the business of the economist to explain: this feature is the positive skewness of the distribution. Positive skewness implies that the "densities of the population" in the lower grades of income or capital value are greater than the densities in the higher grades. There are many poor or relatively poor and few rich or relatively rich; there are many small businesses and relatively few large ones in most industries.

## CHAPTER IV

### ECONOMIC WELL-BEING

A person is "economically satisfied" when he is in a state of being satisfied with his pattern of living. In that condition he is also satisfied æsthetically, morally, spiritually, and in every other way; probably there never has been and possibly never will be one who has attained or will attain that condition.

Satisfaction is a state of mind, a feeling regarding the whole of one's relation to the universe<sup>1</sup> We can increase it or diminish it by making changes in our patterns of living, and we are possessed of powers of realizing to some extent what sorts of changes are necessary to produce these effects on satisfaction. Because, however, we can say at one time that we need a meal, at another we need a book, at another the companionship of a friend, we must not assume that we can regard our whole satisfaction as consisting of material or physical satisfaction plus intellectual satisfaction plus social satisfaction, and so on. Satisfaction is a general state of mind and is indivisible.

The satisfaction that we impute to a meal depends to some extent on the "social satisfaction" we enjoy and this in its turn depends on the "intellectual satisfactions" of which we are capable. All these "separate" satisfactions are determined in magnitude mutually. We are bundles of impulses, instincts and desires, and the state of mind we call satisfaction is due to this psychological pattern. We "impute" a change of satisfaction to some modification of our activities, but the change of satisfaction is a general change. We eat a meal and say we have increased our satisfaction, but it is not merely a feeling of repletion that we regard as satisfaction, it is a general change in our feeling tone.<sup>2</sup> More will be said of this later.

Some writers have attempted to define economic well-being or economic satisfaction as that state of mind which depends upon the possession of material things, some have narrowed it to that

<sup>1</sup> "If you call his outward goods his wealth 'it will be such as to be in harmony with his inward wealth'"—Bonar, J., *Philosophy and Political Economy*, p 14, on Plato's "good man"

<sup>2</sup> "Welfare, however, considered as a harmony forbids the separate quantitative calculus which was a leading defect of the older Utilitarians, and obliges us to consider each factor, or event, in its bearing on the structure and working of the harmonious economic whole"—Hobson, J A., *Free Thought in the Social Sciences*, p 170

which depends upon things that can be bought and sold.<sup>1</sup> Both groups of writers, however, are guilty of the same fallacy, namely, of saying that the indivisible is divisible. All human well-being depends upon material things and so economic well-being in that sense is all well-being, there is, therefore, no need to qualify the term with the adjective "economic".<sup>2</sup> The well-being that is claimed as dependent on things that can be bought and sold depends at the same time on things that cannot be bought and sold.

Satisfaction is a purely subjective phenomenon, it is a personal experience; it is an individual experience. Since it is a state of feeling arising from the relationship of a person to his environment, it is, to speak mathematically, a function of the person *and* his

<sup>1</sup> Cannan, E., op cit, ch 1, Pigou, A. C., op cit, pp 10-11. Both of these authors are, of course, aware of the organic relationship between "economic" and "non-economic" welfare. It would seem that they are driven to make the division in order to combine two traditions in socio-economic literature. The first tradition is that of regarding economics as the science of wealth ("useful and agreeable things possessing exchange value," J. S. Mill, *Pol Econ*, p. 6), the second is that of regarding the science as the study of the "utilitarian calculus" (a fine flower of which is Edgeworth's *Mathematical Psychics*, pp. 56 et seq.). The one is too restricted in its field, the other too wide, the compromise is a reduction of the second towards the first.

Our approach is entirely different. In the analytical study of the conditions of general equilibrium of behaviour with respect to ends and material means (wants and obstacles) there is no need to consider a social sum of satisfactions ("atoms of pleasure") and we are not, therefore, driven to "divide the indivisible".

<sup>2</sup> "It would be going too far to urge that it is impossible to conceive of 'economic satisfactions'. For, presumably, we can so describe a satisfaction which is contingent on the availability of scarce means as distinct from a satisfaction which depends entirely on subjective factors, e.g. the satisfaction of remembering it. But since, as we have seen, the scarcity of means is so wide as to influence in some degree almost all kinds of conduct, this does not seem a useful conception. And since it is manifestly out of harmony with the main implications of our definition, it is probably better avoided altogether." Robbins, L., op cit, p. 24. In attempting to avoid an "extreme" statement, Professor Robbins surely falls from grace! In the first place he makes his conception of the economic field a "classificatory" conception (contrary to his statement on page 16). Secondly, he accepts, by implication, the divisibility of the indivisible. Thirdly, even if the satisfaction of remembering a holiday is dependent entirely on subjective factors (and his present situation has no relevance, which is unlikely) a person cannot remember a holiday and anticipate another at the same time, his "contemplative powers" are limited (scarce and capable of alternative uses).

We hold that there is no such thing as an "economic satisfaction". When Cannan speaks of material satisfaction he thinks of *appetites* and such "material" FEELINGS. When men speak of moral satisfaction they think of the satisfaction of a conscience or *sense* of right and wrong. When they speak of æsthetic satisfaction they think of their *sense* of beauty. Where or what is the *economic sense* whose satisfaction would be an "economic satisfaction"? "The habit, prevalent among certain groups of economists, of discussing 'economic satisfactions', is alien to the central intention of economic analysis" (ibid., p. 24). "There are no economic ends. There are only economical and uneconomical ways of achieving given ends" (ibid., p. 129).



environment. Two different persons may have access to the same resources and one may be satisfied and the other dissatisfied, the difference lies here in the persons. A single person may say that one pattern of resources is more satisfactory than another, the difference here lies in the pattern. To attain a condition of being satisfied may involve a change of environment or a change of taste or philosophy.

Since satisfaction is a subjective phenomenon it is impossible to measure the satisfaction of different persons by a common measuring rod<sup>1</sup>. We cannot even take their groans or smiles as sure indicators for some people groan under little provocation and others smile on the slightest pretext—or so we think. Nor can we take the quantity of resources accessible to them as indicating opportunities to attain satisfaction, some people with small resources are satisfied and others are not, some are not even satisfied with extensive properties at their disposal.

A realization of the fact that satisfaction is the feeling associated with the adjustment of man's body and mind to the environment in which he is placed makes us realize that a lack of satisfaction, a condition of disequilibrium, is due to poverty of means external to himself or "poverty of body or soul". Alternatively, viewing the position with no consideration of values, we may say that disequilibrium is due to excess of means or excess of "body and soul". In whichever direction there is a lack, equilibrium requires that the lack be removed, or, in whichever direction there is excess, equilibrium requires that the "excess" be removed. Ordinary experience suggests that dissatisfaction may, in fact, be explained in both of these ways.

There are those who are in a state of imperfect satisfaction through lack of means; the poor are in this position. Others are out of adjustment through excess of means; some of the rich, embarrassed with riches or demoralized by them, are in this position. We think the trouble of some is that they are not sufficiently educated, have not the correct traditions or standards and are unhappy because they cannot use what they have, while we think that others should reduce their desires; they are unhappy because they want too much. Poverty and superabundance are maladjustments.

<sup>1</sup> Since "Welfare Economists" make the assumption of the comparability of men's satisfactions (as an "unverifiable probability") they use money as the measuring rod of welfare. See Pigou, A. C., op cit Kahn, R. F., "Some notes on Ideal Output," *Economic Journal*, March, 1935, pp. 1-2. See also Hawtrey, R. G., *The Economic Problem*. Robbins, L., "Mr Hawtrey on the Scope of Economics," *Economica*, 1927. Very effective criticism of the conception of Economic Welfare is to be found in Benham, F. C., "Economic Welfare," *Economica*, 1930.

In any case, if we approach the problem of adjustment through satisfaction we conceive of poverty as a feeling of lack and wealth as a feeling of abundance. He who is poor feels bound—unfree; he who is wealthy feels free. Poverty and wealth, like satisfaction, are subjective phenomena. Lack of means, and lack of ability to enjoy means possessed, bring a person to a condition in which he feels thwarted. In both cases he will attempt to make the adjustment—unless he is demoralized and behaves in an uncoordinated manner, becoming, in a sense, pathological. Our society unfortunately provides many instances of persons who have become pathological through lack of means or excess of means, or lack of desires or excessive desires.

By a strange paradox, if perfect satisfaction could be attained, we should have a condition of universal unfreedom. Equilibrium is a condition from which there is no tendency to move, so a person who is completely satisfied is the most bound of all—and yet he feels free because he can attain what he wants to attain. There are many people in the world, perhaps, who have attained something approaching this state of being. Age plays its part and man's power of adaptation also. Within the limits of what they can do, many have accommodated their minds to a certain quantity of resources and have become unfree in the process, the "daily round of common tasks" is a description of the lives of a considerable section of the population.

A survey of economic well-being in a community really involves, therefore, a survey of the population with a view to discovering the extent to which they are satisfied or are in adjustment with their environment. It is perfectly clear that it is impossible to discover a "total satisfaction" for a community, since satisfaction, being a subjective phenomenon, cannot be measured in different individuals by a common standard, and it is impossible to make a distribution survey, showing the frequency of certain degrees of satisfaction, for the same reason that there is no standard unit of satisfaction even for individuals. It is possible, however, to devise a *mode of thinking* that will help in forming a judgment.

We cannot make any precise comparison of quantities of resources which different people have the right to use, for the reason we have given earlier, that dissimilar things cannot be added; we cannot say, for example, whether a pound of beef and two pounds of potatoes constitute a larger or smaller quantity of resources than three pounds of bread and one pound of butter. If, however, we reduce all resources to money value—as our exchange economy tends to do—we can say that people's resources are, at a given moment, proportional to their money possessions. The extent of

people's monetary resources must not, however, be considered as measures of satisfaction, for we know that, with a given individual, satisfaction is not proportional to money possessions. But we can conceive of a relationship between the money resources a person possesses and the money resources he desires in order to attain a given standard of living, the price scheme being what it is. If a person possesses £500 but considers that he requires £1,000 to attain the degree of satisfaction that he desires then he is £500 short. This may be expressed as a shortage of 100 per cent of what he has or of 50 per cent of what he would like. Thus, if every person could make a return of what he wants and what he has in terms of money, we could make a table showing the frequencies of certain percentage deficiencies (or excesses!) It would not be a survey of satisfactions and dissatisfactions, but it would be a survey giving an objective expression of men's feelings with regard to adequacy and inadequacy of means.

It would be relatively easy to obtain figures from heads of families, say, of their possessions or incomes (Inland Revenue authorities and other authorities have the information to a large extent), and it would not be difficult to induce people to say how much they would like! The value of the figures would be very questionable. A survey by sample would, perhaps, yield better results, though even this would not give results of a high degree of reliability.

A common assumption is made that if people were asked what amount of money they would like to possess they would, in a large proportion, mention some very high figures indeed, figures usually associated with millionaires. If the question were asked in a form that suggested that the cost of providing it could be neglected such absurd figures might be given, but if people were asked to state what, in their present state of mind, they would regard as a reasonable style of living, in which they would have ample scope for enjoying life, there is reason to think that such flights of fancy would not be indulged in to any considerable extent. Probably there are few—even among young people—who really want very consciously to be millionaires. What they are accustomed to has an influence on what people desire.<sup>1</sup>

There are several other possibilities that are at least equally likely. It is probably true to say that a large percentage of people would like more than they have, there are wide differences, of course, but ordinary intercourse with ordinary people at ordinary times suggests this. If they had more they would probably want more still, but, at a given moment, there is reason to believe that

<sup>1</sup> For a fuller discussion of relevant matter, see Pigou, A. C., *op. cit.*, p. 48. See also Robson, W. A., *The Relation of Wealth to Welfare*.

people view their wants in the light of what they have. It might, indeed, be suggested that some people have rather more than they "want". Thus only can one explain the fact that some people are "rich" on £500 a year while others are "poor". Some, with £500, want what can only be obtained for £600 or so, and others with the same amount of possessions, want what can be obtained for £400 or so. The "nouveaux riches" are in the latter group while the "nouveaux pauvres" and ambitious are in the former. Useless as the actual ratios may be between deficiency (or excess) and that which is wanted or possessed, it is a useful conception when studying the conditions of so-called maximum social satisfaction. The maladjustment may be conceived as measurable by the following formula:—

$$\frac{\text{actual possessions} - \text{desired possessions}}{\text{desired possessions}} \times 100 = \text{maladjustment (per cent)}^1$$

If every individual possessed means equal to those he desired the maladjustment would be zero and all would be perfectly satisfactory. A table is conceivable in which individuals are classified according to the degree of maladjustment. Some would be found positively maladjusted, in which case they would possess more than they desired. There are such people, no doubt, in most communities: some of them show evidence of unco-ordinated livings; others "save" their surpluses. Those who are negatively maladjusted are in a condition of relative poverty: some of these show evidence of unco-ordinated living and some of them tend to run into debt.<sup>2</sup>

This conception of maladjustment enables us to discuss the question of inequality or equality of incomes with a certain degree of objectivity. Propositions are frequently made that "incomes" should be made equal for all members of the community. The formula suggests at once that the stability of such a distribution—the perfection of satisfactoriness—depends upon an equality of desires and possibilities. If all were given equal money incomes or equal purchasing power there could only be an absence of maladjustment if all desires represented equal purchasing powers and there is no reason to think that this would be so. There is no more likelihood of equal money possessions giving no maladjustment than there is of a distribution of boots of equal size giving everybody a perfect fit.

<sup>1</sup> Compare the conception of an optimum population Dalton, H., "The Theory of Population," *Economica*, 1928

<sup>2</sup> *Poverty-lines* are usually based on the needs of some *objective* standard of health, etc. See Rowntree, B. S., *Poverty. a study of town life*.

Actually, the formula suggests that a condition of general low maladjustment might exist even when there is considerable inequality of purchasing power possessed. To the extent, say, that it is generally accepted that society should be hierarchically constructed, it is conceivable that a poor man can be satisfied "at the gate of the rich man's castle". Perhaps, at one time in the history of this country, this conception of the order of things was generally accepted and there was, consequently, less "discontent" than the difference in external possessions would suggest as likely; to-day it would seem that the hierarchical conception has been extensively rejected and the standards of living enjoyed by the rich have become more generally desired by the poor, so that there is more discontent.

One thing is certain, namely, that it is useless to measure progress, with a view to producing contentment, by indicating to the poor that they live in greater physical comfort than a paleolithic chieftain. Men feel their poverty by comparison of possessions and desires, and what they conceive to be possible is related to their desires. The "poor" of to-day are "better off physically" than they were a century ago, but this is not evidence that they feel less poor.

The claim for equality of opportunity would seem to be a more reasonable claim since it implies an adjustment of means and desires, and the means that men require to give them the fullest opportunities for satisfaction vary as their desires vary. It is a superior claim to that of equality of possessions because it implies that in making the adjustment steps should be taken by way of education, intellectual, physical, and moral, acting upon men's desires as well as upon the means of gratifying the desires. It accepts the fact that satisfaction, a psychological condition, results from the right adjustment of wants and possibilities of satisfying them.<sup>1</sup>

Diagram A makes possible a visual representation of any scheme of distribution of maladjustments. Along the horizontal axis are marked the *actual possessions* which an individual owns and he himself is indicated by a dot vertically over his actual possessions at a height representing his *desired possessions*. The radiating lines enclose areas showing the location of those whose desired possessions lie between 0 and 25, 25 and 50, and 50 and 100 per cent. etc., in excess or deficiency of their actual possessions. The distribution of the dots shows the amount of conformity to the perfect adjustment. If the dots fall mainly on the upper side of the perfect adjustment line, there is a large frequency of those who feel poor, if they

<sup>1</sup> See below, Section V, Chapter II, on Equality and Inequality, pp 332-6.

fall on the lower side of this line there is a large frequency of those who feel rich. The most perfect adjustment of all would result in all cases being placed on the middle ray of the diagram.

The diagram is only of suggestive value and it only presents a conception of the distribution of the ratios of resources possessed and desired in *general*; that is, it only presents a conception of

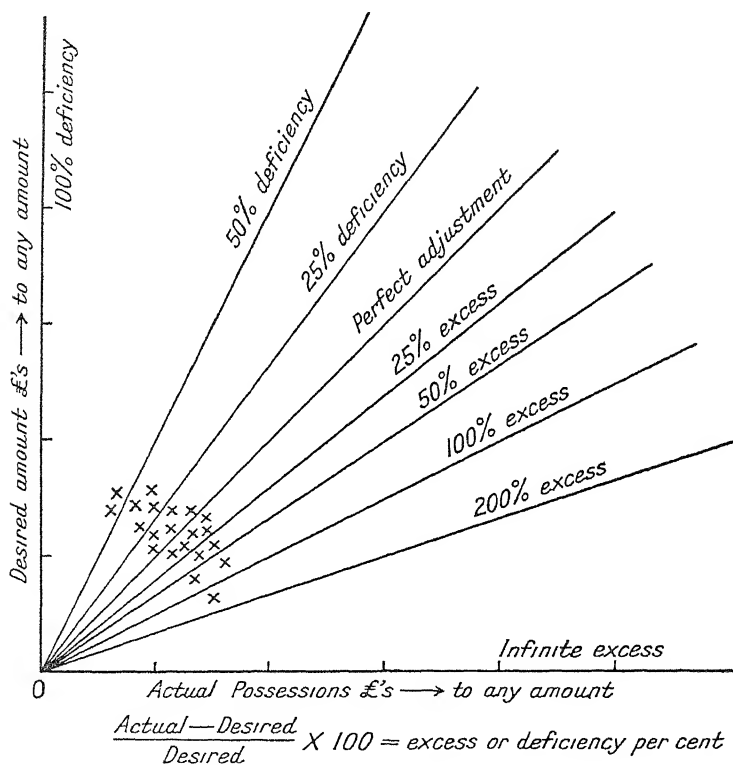


DIAGRAM A

the distribution of ratios of total possessions and total desires. A ratio in general terms can only be presented as a ratio of money value held since money value is the only form in which we can reckon resources in general. We can understand, however, that even in a society of one—a Crusoe society—there might be experienced (and probably would be) a feeling of shortage. In such a case the shortage would be felt in particular ways and perhaps most of all in the direction of personal energy or labour.

Robinson Crusoe's "feelings of poverty" we may ascribe simply to physical causes. An ordinary person in an ordinary society may attribute his shortage to the fact that others have what he wants. The kind of property maladjustment that we have hitherto considered may, therefore, be due to the *shortage of property rights*.

Now maladjustment of any kind is a condition that tends to make the maladjusted person attempt to remove it and if, within the scheme of property rights, a person feels that it is this lack of rights that causes him to feel poor he will consider ways and means of correcting his poverty<sup>1</sup> We have, in this chapter, really analysed the situation which causes changes to be attempted in the distribution of property. From the individual point of view the instability of his position is due to "scarcity of property rights", and he attempts to resolve the instability by acquiring more freedom, by persuading or compelling others to allow it<sup>2</sup>

There is, however, another aspect of the "satisfaction distribution" which we have hitherto disregarded. A person may be very dissatisfied with his lot in the way in which we have indicated and, at the same time, be very satisfied with his pattern making in another respect. He may be poor but he may make the best of his circumstances. Within the field of his socially permitted freedoms he may attain something approaching perfect satisfaction.

That men never, at any moment, attain perfect satisfaction, even in this respect, is very likely, but that they tend to do so is equally certain. The economist has no means whatever of deciding whether a person is or is not completely satisfied in this respect; he can only assume that at any moment he does what he does because it is the best. The dissatisfaction which a person experiences through the resources in his power not being in the most perfect pattern possible is the dissatisfaction which drives him to alter the juxtaposition of material resources and to exchange rights of property with others. The latter part of his activities we have already termed the processes of secondary distribution of property.

It is possible to see a unity in the two groups of tendencies of men to correct dissatisfaction. In this case we say that a person exercises all the power he can—by trading or by "political" methods—using all the resources he *can* in order to attain equilibrium. He may do the best he can and he may still

<sup>1</sup> This is the economic significance of poverty, it may mean that there is a lack of equilibrium in the economic structure.

<sup>2</sup> If it is true, as Mill says, that "Men do not desire to be rich but to be richer than other men", we have circumstances which makes general satisfaction impossible: we are always bound for disequilibrium! Mill, J. S., "Posthumous Essay on Social Freedom," *Oxford and Cambridge Review*, quoted by Pigou, A. C., op. cit., p. 48.

be poor : he may be completely satisfied with the procedure he adopts and yet be very dissatisfied with the result. Dissatisfaction, however, is a condition of instability, and men strive to remove it by using those rights of property which they possess and by altering the distribution of property so that they may attain their perfect adjustment.



## SECTION II

### *ECONOMIC FLUX*

#### CHAPTER I

#### INTRODUCTORY

In the first section of this book we took, with the "economic camera", a series of snapshots of man in the process of living; we are now to use an "economic ciné-camera" and make a moving picture of that process

The snapshots enabled us, as we said before, to accustom our eyes to certain features of the pattern of human living, to find a steady focus, so that when the moving picture appears on the screen we are able to follow the building and crumbling, the flowing and damming and, perhaps, obtain some conception of correlation in movements. We shall be occupied with this living picture throughout the remainder of the book, but in this section we shall be content to comment on the more general features of the movements. In later sections we shall need to employ some of the devices of the ciné artist and show close-ups, slow motions, insets, and variations in lighting.

The first and most obvious feature of our cinematograph is the incessant *physical change* which it exhibits. If we direct our attention, as we must, to the human beings in the scheme we observe that there are changes in them as well as in the things which are about them.

Men are born, grow old, and die. From dust they come, to dust they return. Some fall sick and recover, others die before they grow old. The birth-rate and the rates of death at different ages change in the course of time and the proportions of the population at different ages consequently change. More boys than girls are born in Western countries, but males die more frequently than females, leaving the sex constitution fairly, but not absolutely, constant. These proportions of age-groups and sexes vary from area to area owing to migration, from some areas men leave and from others women; to some areas men go predominantly and to others women; the middle ages move most. Over the whole world, in most countries, the population is growing, though in many countries there are signs of the approach of maximum numbers.

Individuals, in their own life courses, vary in physique, in mental capacity, in skill, judgment, taste. The population as a whole varies from time to time in average physical and mental strength and capacity, it varies in its distribution of skilfulness and standards of taste.

Some of the changes take place independently of man. The sea encroaches on the land or retires therefrom; climate varies. "The hills are shadows and they pass from form to form, and nothing stands." Man brings resources together and builds his houses, factories, machines, railways and roads, bread, furniture, and clothes. But these things go. Some are changed in form by man's use of them, some go slowly and others quickly through natural decay. Matter and energy remain, but their forms and places change.

By his movement and by his labour man is incessantly arranging the things about him or adapting himself to them. As buildings crumble he renovates them, or, letting them crumble, he replaces them with similar or new types. He eats his bread and renews his supplies. He uses his coal but, not being able to renew the supplies, he turns to other sources of heat and power. In the welter of change man is seen adapting, altering, maintaining appearances.

This is the great flux in which the economist is interested. It is a dissolving picture of real resources and out of his place in this picture man distils his "satisfaction", his joys, and sorrows.

The next great change which we observe in the moving picture is the change in the units of control. Families grow up and break apart, the "elements" coalescing to found new families. Some of these succeeding units carry on with the ancestral resources, maintaining over generations certain resources and schemes of living. Others break up the property of their forebears and go forward to gather new resources. Corporations come into being, flourish, and disappear. Companies are created, grow for a time, combine or break up and live in new forms, or disappear. Voluntary societies arise, work for a time and give way to new types, pursuing new interests. Some institutions, like the churches, universities, and municipal corporations, live longer than most. States change their structure and their methods of control; some disappear, others arise. In the organization of control amongst men there is the same eternal flux as that which we see in material things.

In the "holdings" of units there is the same ceaseless change. The holdings of real resources and money vary from time to time, vary momentarily over the whole system. Some of these increase in total as well as in individual holdings. Real resources, of course, cannot increase in total, except in specific forms. As steel is increased, pig iron is diminished; as pig iron is increased, iron ore diminishes,

and so on. Money can, however, increase in quantity without a reduction of other things being involved. If it is of gold, of course, its increased use as money means its diminished proportionate use as an industrial material, but if it is of paper, issued by the state, the number of units of account can be increased at no cost of other things, since, for instance, it is as easy to print a note for £1,000 as for £100.

Securities and liabilities, rights and duties ultimately to give, sell, buy, borrow, or lend real resources or money vary as all other resources held vary. Liabilities are honoured and disappear; new ones are made. Securities are made and sold, to be cancelled later. Sometimes the creation of securities and liabilities takes place at fever heat—at other times it falls to a very slow pace. Sometimes impossible undertakings are made and men strive for a time to fulfil them, their schemes falling to pieces; speculators, acting on expectations, are sometimes deceived, and their plans go awry because they have acted on wrong assumptions.

The rates of flow, from unit to unit, of money, real resources, securities and liabilities, vary from time to time. Sometimes buying swells at the expense of borrowing; sometimes giving and taking grow and buying and selling flag. In buying and selling, the relative flows of money for purchase and things that are purchased, vary. Sometimes the flows increase in both directions, sometimes they diminish in both directions and sometimes they change in opposite directions. The ratios of these flows are prices and they rise or fall, rise in some places, fall in others, rise in some kinds of transactions, fall in others. Sometimes they rise in almost all; sometimes they fall in almost all.

These prices are of various things. The hire payment of men we term wages; of real resources, rent; of money, interest. Businesses pay out prices of materials, rent, wages, interest, and sell or hire their “produce”. That which comes in goes out to pay their commitments; the surplus is profit, and it is paid to those who own the business. Profits and losses vary, and lending and borrowing, buying and selling of securities, vary as a result.<sup>1</sup>

Values held by different units vary from unit to unit, from time to time, in irregular distributions. These changes in value held give some units greater scope for their activities while other units grow more and more restricted and sometimes cease to be. Some units, starting with low values, rise and rise for years; others, with large values, fall away.

Meanwhile, if we could insert into the “hearts” of men some

<sup>1</sup> The terms “profit” and “interest” are here used in the ordinary colloquial sense. They are defined, more precisely, below.

instrument that measured their degrees of satisfaction, we should record the same ceaseless rising and falling irregularly distributed throughout the community. At times there might be a very general tendency to rise or perhaps a general constancy, but at other times there would be great disturbance and general fall

Sitting back as the picture unrolls, we begin after a time to ask ourselves certain questions. As men, we keep an eye on the satisfaction indicators and wonder how we can keep them steady, high and mounting, as economists we are concerned with the mechanism of the system. Flux we must have since men and things decay, knowledge and tastes develop, but what causes the variations in flows, variations in sizes of units, growth of some units bigger and bigger, the dwindling of others to nothing? There are some elements which remain relatively constant for fairly long periods. Why should there be these stabilities?

These are some of the questions we ask ourselves and it is the business of the economist to discover some of the answers, to reveal the necessities of the process of pattern making which we call living.

## CHAPTER II

### THE PHYSICAL FLOW

The water of a mill pond flows over the wheel, serves the miller, and passes on. Man generally is, to the universe of energies about him, in the same relative position as the miller to the stream. He harnesses these energies for a time, makes his patterns of resources, collects their services, and then has to let them go. His own energies are part of the stream, and these he uses while he stays and then they, too, pass on.

The mill stream remains continuously, but the water of the stream is always changing. This is characteristic of all the patterns which man weaves in his living activities. Patterns of energies may remain constant—for a time—but the energies are in a continuous process of dissipation. The constancy of any physical feature is only possible if the energies which are dissipated are replaced in the patterns.

A very large part of human living consists of this process of replacement—the process of maintaining a pattern when the resources which compose it pass away. The other part of living is concerned with the making of new patterns, sometimes entirely new and sometimes new perforce, simply because the old ones cannot be maintained.

With this basic conception in mind, it is intended, in this chapter, to reveal some of the *physical possibilities and limitations* within which man works in his business of pattern making.

The first physical fact that must be noted in this examination of the process of pattern making is that no pattern can be made without human labour. "Man is the father and Nature is the mother of wealth" said Sir William Petty, and all economists have agreed with him. To control the course of Nature, which is the inner necessity of pattern *making*, it is essential that physical energies should be in direct contact with the human willing or wishing or deciding power, in other words, with the human mind. The human mind directly controls the energy of the body within which it resides and, therefore, where a person wishes to make a new juxtaposition of physical resources, he must, so to speak, "seize the oar," and the oar is his labour. Labour is human energy which can be directed towards the creation of a pattern of physical resources. It cannot act independently—it must always operate

in conjunction with other things and these are the material resources surrounding man. Though labour is a "directing" force, it is also a part of the pattern.

Looking at the business of pattern making from the physical point of view, it may be said that it consists of the employment of labour on the material resources of the universe. A person may control other labour than his own—by authority or persuasion—but ultimately all pattern making resolves itself into the allocation of human labour to the control of other resources. A clear appreciation of this fact shows the confusion of mind which has led some economists to speak of saving, organization, and risk bearing as co-ordinate with labour and material resources as requisites of production. Saving, organization and bearing risks are not material resources; they are types of decision concerning the employment of resources. The only *real* resources which man can employ are labour and other material things.<sup>1</sup>

Economists, as a rule, introduce a third material resource as a necessary "factor" of production in the form of capital or capital equipment. It is true that in order to obtain some—indeed, almost all—results, it is necessary that certain instrumental forms made by man should be employed, but capital in this sense is only a particular form or pattern. The fact that a machine has been "made by man" is not the reason why it is used, it has, in fact, been made because it can be used. A machine is itself a pattern of resources which has been made by labour with material resources.<sup>2</sup>

The second basic fact to note is that the process of living, the regulated part of the flow of energies, is a continuous process in the sense that the pattern of energies or resources at any moment is derived from the pattern of resources at the previous moment. Thus we may consider living as a continuous process of modification of patterns in existence and there are one or two important corollaries of this.

In the first place it follows that human labour, at any moment, must be regarded as allocated fully to some purpose and that any modification of the pattern of living involves not merely the *use* of labour, but the *deflection* of labour from some other allocation. This is a physical necessity; we shall see at a later point in the book that this fact is of great significance in economic theory<sup>3</sup>; here we mention it simply as a fact. Often enough a person is said to be "doing nothing" or wasting his time, but from the *physical*

<sup>1</sup> See above, p. 22, footnotes.

<sup>2</sup> See below, p. 67.

<sup>3</sup> This is the "physical" basis of the "alternative use" or "displacement" theory of *real costs*.

point of view this cannot be said. "Doing nothing" and "wasting time" are expressions which imply some valuation of the activities, but from a physical point of view there is no such thing as valuation.<sup>1</sup>

In the second place the conception of living as a continuous process of modification helps in the elucidation of the common classification conceptions of raw materials, capital equipment, and final goods. This time-honoured classification of the resources employed by man is becoming more and more presented as primary, intermediate (or instrumental), and final goods.<sup>2</sup> The newer terminology emphasizes more effectively the significance of the classification since it draws attention to their being "stages of production". Primary goods, raw materials, or original resources are the resources "fresh from the hands of Nature"; capital, intermediate, or instrumental goods are those which have been produced from original sources in order to facilitate the production of final or consumption goods. The underlying conception is that of man taking the materials from Nature and destroying them in use and the aforesaid stages are stages in the progress from Nature to destruction. The commonly made distinction between capital and final goods is that the former exist simply to increase the production of the latter while the latter are produced merely for the sake of consumption or destruction, for the satisfaction that is derived from their use.

That there is such a thing as a "roundabout" method of production is perfectly obvious, and when "a" is used to make "b" which is used to produce "c" there is a significant sense in which we may say that "b" is an intermediate product made in order to facilitate the production of "c", and it is extremely important that we understand this relationship of "primary, intermediate, and final". We must, however, observe that from the physical point of view the description of a resource as "final" is arbitrary.

To a machine builder, a machine is a final product; to a coal-miner, coal is a final product. The classification made by economists is claimed to be in the order of progress from the "social point" of view, the most general view of all. It is, however, from the physical point of view, no more correct to regard food, clothes, and houses as final goods than it is to regard machines as final goods—as they are—to the machine builder.<sup>3</sup> The over-emphasis on this classification is due to a very simple misconception.

<sup>1</sup> This also applies to all material things. They *are*, and "physically" this is all we can say of them. When we say they are in use we attach significance to them.

<sup>2</sup> The terminology of the "Austrian school" following Menger.

<sup>3</sup> "Such reflections on the existence and fundamental purpose of capital in human society are, so to say, of a broad *sociological* order. They should

It may be asserted without doubt that economists of the nineteenth century worked mainly with the idea that their subject was concerned with the production and consumption of *things*, they never employed the conception of *pattern*. Had they seen that men were concerned with patterns of living and not with quantities of things they would have realized that what they called "consumption" was really a form of "production", they would have realized that they could not consume without making a pattern.<sup>1</sup>

When it is realized that "final" goods are always "consumed" in the production of a pattern it is clear that final goods cease to be final and become intermediate. Further, it is realized that the consumption of food, one of the final commodities *par excellence*, is a means of producing men who produce more food and so on. The enjoyment of all living produces "men of experience" and these are "intermediate" goods. Physically, the economic processes are circulatory and there is neither beginning nor end of a circle.<sup>2</sup>

A further point that must be noted in this connection is that, just as we may classify non-human material things (or patterns) into raw materials, intermediate goods and final goods, so, strictly speaking, should we classify men. This would seem to be rather difficult since no man falls wholly into any one of the categories. Every man can, however, be regarded at any particular moment as belonging to one or other of them. For example, a young person beginning his apprenticeship is often described by his employer as "raw material", which, of course, he is; his training converts him, however, to an intermediate resource. When this apprentice (or journeyman, or craftsman) spends his evenings at a concert he is "using himself" as a final good; he is using himself for the simple purpose of producing satisfaction. So also, we may say of a singer that when he sings on the platform he is being "consumed" by his audience, just as chocolates are consumed during the intervals.

Even the process of procreation is a process of production and consumption. Parents are the resources employed in the production of children, along with the food and other means of rearing them.

not be allowed to distort our view of the structure of capitalistic production, that is, of facts of a *technological* order, as is the case when capital is conceived as intermediate products in the actual productive process of the 'linear' view"—Nurske, R., "The Schematic Representation of the Structure of Production," *Rev. of Econ. Stud.*, vol. 11, 1934-5, p. 239.

<sup>1</sup> The conception of general equilibrium implies this unity. It presents, "a combined picture of consumption, production, and exchange"—Ricci, U, *op. cit.*, p. 3.

<sup>2</sup> The "orders" of goods are based on a *linear* conception—from production to destruction (consumption).



The raw materials from which the population is made are the physical elements of the universe as are the raw material of all other things "produced".

A diagrammatic representation of the idea we are here expressing is given below (Diagram B) The inner circle represents the raw materials whence all come, men and other things used in the patterns. Men and things are shown as the smaller circles and each group is divided into intermediate and final labour and goods

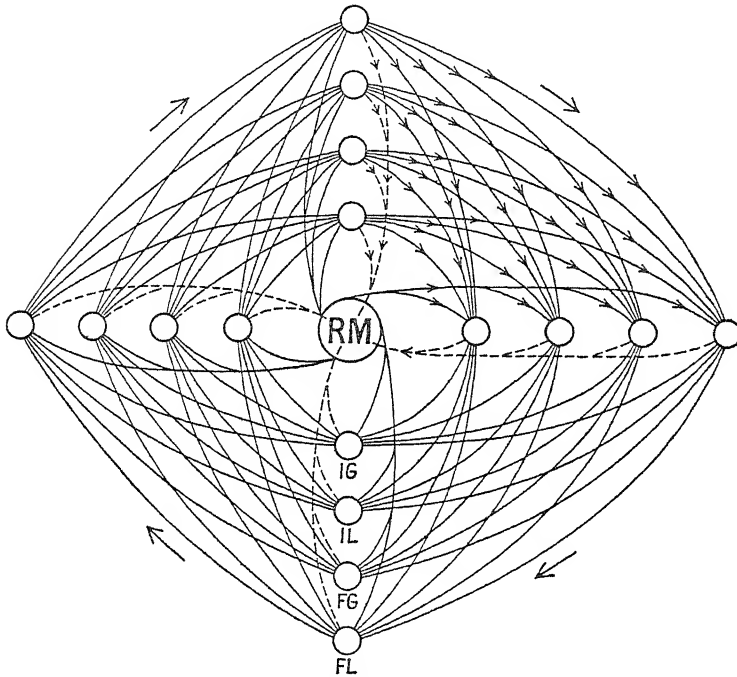


DIAGRAM B

respectively The lines, when followed along the directions of the arrows, show how these are combined to form new patterns, the dotted lines indicating that the resources "waste" away and return to the central reservoir of raw materials.

A careful contemplation of this diagram will reveal several of the physical necessities within which men work in the creation of their patterns of living

Firstly, it shows that the pattern of living at any moment consists of the raw materials, intermediate, and final resources, human and non-human

Secondly, it shows that the process of pattern making is continuous and that, at all points, the resources are continually escaping, back to the raw material category whence they are brought. This reveals the significance of the classification of resources into primary, intermediate, and final categories as a technical matter. It also shows that caution must be observed in the use of this classification. Physically, the various orders of goods are seen to be merely goods at certain points in the circulation relative to certain other goods in the circulation<sup>1</sup>.

Thirdly, the necessities for the continuance of any given pattern are made clear. The maintenance of any group of resources depends upon the flow of "replacements".

Fourthly, the "reduction of waste" is seen to be equivalent to an increase of the stocks or flows of the resources. From the simple physical point of view there is no such thing as "waste", since "waste" is a value conception, but it is obvious that a reduction of the rate of return to "unharnessed" resources of energies and

<sup>1</sup> This diagram presents a view of the technological relations between the various orders of goods which meets the objection raised by M. Ragmar Nurske (op. cit.) to the "Ringschema" of Bohm-Bawerk (*Positive Theorie des Kapitals*) and the "triangular representation of Professor Hayek" (*Prices and Production*). His objection is that these authors take a linear view of production, "a strictly one-way road" from original resources to consumption goods. This involves them in tracing back the production of a final commodity to that "point in the history of the human race where primitive man, with his bare hands, first fashioned a tool" (p. 233), or, looking forward, they should be able to find "a stage where labour and land without the aid of capital, produce the 'first' intermediate products of the synchronized process", but this "beginning" is "impossible to locate in the real world" (p. 294). He quotes Dr. Haberler's words (not intended by their author as criticism of Bohm-Bawerk) ("Der Stand und die nächste Zukunft der Konjunkturforschung," *Speiethoff-Festschrift*) to the effect that "the process of production takes no straight path, its course is, rather, a circular line which turns back into itself, any number of times, before reaching the final stage of consumption." "The iron and machine industry, for example, produces for the lower stages (for the consumption industries) as well as for the preceding stages (e.g. for the mining industry)." (p. 294).

The "Ringschema" of Bohm-Bawerk and the "triangle" of Dr. Hayek are analytical tools. All production is forward looking and the iron industry, in producing for the consumption industries, is not of so high an "order" as it is in providing for the mining industry. Analytically, the "turning back" process would surely involve us in considering a colliery company as raising to-day the coal it burnt yesterday! At the same time Mr. Nurske is right in showing that the process of tracing production backwards to its original physical resources leads ultimately to the beginning of history, but the beginning is not where he places it, at primitive man shaping the first tool with bare hands; it is in the Garden of Eden, where Adam was raised from dust! Original resources, physically, are land, and do not include labour!

On page 54 we describe the process of physical production as a circulatory process. Strictly speaking it is of the nature of a *spiral* process with the ends leading out of and back again to the raw material category. And every commodity is a complex of many spirals, some of them, doubtless, beginning "in the beginning" and others at all times since.

materials is the same thing as maintaining them in the "harnessed" category of resources.

The full value of the diagram can, however, only be appreciated in the light of knowledge of the technical qualities of the resources and physical necessities that are not here represented and we must now indicate some of these

Physical resources have specific qualities and their employment in any pattern depends upon their being chosen because of their appropriateness. Thus, labour can only be obtained of men, skilled labour of skilled men and unskilled labour of any man. Bread can be eaten but stones cannot, petrol is inflammable, and so on.

To produce certain forms or patterns of resources certain other specific resources must be employed. Bread must be made of flour, yeast, salt, and water; bricks are made of clay. True we may produce substitutes or use substitutes, but such use implies a change of pattern of production. It may be that these substitutes are preferable, but in a "physical" diagram we cannot represent different physical patterns as identical or different in value; we can only show the necessities of a given pattern.

The long controversy concerning the productivity or non-productivity of labour which began with the Physiocrats and continued late into the nineteenth century pursued its weary way very largely because economists did not realize that what they were trying to say was precisely this: that for the preservation of any particular pattern of living there are certain physical necessities. The Physiocrats were concerned to show that no society could persist that starved its farmers and robbed them of their seed, for all members of society depend on food. The Classical writers of the early nineteenth century were concerned to show that no physical pattern could persist if labour and resources were not employed adequately in the process of replacement of physical resources, nor could certain physical resources be increased in quantity (that is, certain physical patterns) unless labour and resources were applied thereto. When we put the matter in the form of a consideration of physical necessities, the generalizations which these earlier writers were seeking to formulate become obvious; the maintenance of any pattern of living demands a certain allocation of resources to replacement, as a physical necessity.

Among the qualities which resources possess in various degrees—it would be more correct to say "qualities which patterns of physical resources and physical resources themselves possess"—is the quality of durability. This quality is of such general significance as to necessitate special discussion.

By "durability" is meant persistence of form or arrangement,

the retention of specific qualities through time. Any line drawn between durable and perishable resources or patterns must of necessity be arbitrary since there is an infinite gradation from zero to a period bordering (for practical purposes) on infinity. A light applied to petrol lasts a minute portion of time; granite houses last through centuries and the sun shines through an "infinite" period.

There are, however, two *kinds* of durability of resources as well as many degrees, which are of interest to the economist. A thing is durable if it has great resisting power against the "natural" forces of rust and decay; the noble metals are excellent examples of these, and flowers are at the other extreme of perishability by nature. A thing is also said to be durable if we can "use" it without destroying it or, if we destroy it, we do so slowly—a picture can be used without being destroyed, but clothes wear out and food is "consumed." The classification table below shows that resources fall into four wide groups because of their being classifiable according to durability and perishability in use and durability and perishability by nature.

| <i>Material Resources<br/>and Patterns</i> | <i>Durable by Nature</i> | <i>Perishable by Nature</i> |
|--|--------------------------|-----------------------------|
| <i>Durable in use</i>                      | e g gold, houses         | Flowers                     |
| <i>Perishable in use</i>                   | Coal, wheat              | Fish, meat                  |

(It is difficult to place man himself in the table because it is customary to take the life of man as a standard: he is durable as compared with flowers but perishable as compared with some buildings. The standard of comparison is, of course, arbitrary.)

Durability (or its absence) is a quality of things and patterns which exercises profound influence on the process of pattern making. It is the quality which confers upon the resource or pattern concerned the capacity to render its services (or disservices) at different points of time. Durability-in-use has the effect of *extending* the amount of services which may be obtained from a resource, if it is durable by nature. Durability-by-nature makes a service mobile through time, if the resource is perishable in use. If the resource is perishable by nature its use is limited to the immediate future or present while, if it is perishable in use, the service must be enjoyed in the present or it may be postponed according to its perishability or durability by nature.

Durability gives us greater freedom in making patterns, though it sometimes restricts our freedom. We owe to it partly the physical

heritage we have received from our forebears. Buildings, machines, furniture, drainage schemes, water schemes, a large proportion of these patterns were made before we were born. Some of them we find useful, some of them we do not want. We derive pleasure from some as interesting relics; from others we derive nothing but trouble. A large amount of our work is absorbed in "undoing" what our forebears did. The elaborateness of our pattern of living is due very largely to the persistence of the patterns made at earlier times modified by the efforts of later times. Present activities are, to the products of earlier activities, what the living cells of a tree are to the dead timber in the heart of the trunk, or the recent depositions of a shell fish are to the earlier depositions which have made its shell. It is a significant thought. The generations of men move on leaving their more or less enduring impressions on the pattern, and the directions in which we move are determined in part by the directions in which our ancestors have moved.<sup>1</sup>

The making of durable records of our experience has made possible the accumulations of knowledge at a greater rate than was possible when the most durable records were memories only. This accumulation of knowledge is, as it were, a pattern of signposts leading us to the more detailed understanding of the world we live in. Error as well as "truth" has been transmitted to us and we have much work in unlearning error as well as in learning new "truths". This accumulation has given us freedom and unfreedom in pattern making.<sup>2</sup>

Things which are durable by nature and perishable in use are capable of being retained for later employment. These are the things we can and do hoard. Their perishability in use makes it necessary for us to replace them if we want them. Things that are durable by nature and durable in use we can, if we wish, hoard, but in this case we are altering our pattern. If they possess both kinds of durability we can retain a pattern with no replacement, but if we cease to want them their durability is a condition that makes us use labour to alter them. The things that are perishable by nature we must use at once or lose altogether. If they are required as permanent features of our patterns then we must renew them frequently, whether our use affects them (as in the case of fish) or not (as in the case of flowers).

The relationship between durability and rates of renewal is a matter of great importance. The maintenance of a particular scheme of living obviously depends upon the renewal of resources

<sup>1</sup> Cannan, E., "Capital and the Heritage of Improvement," *Economica*, 1934, pp 381-392, and *Review of Economic Theory*, ch. vi.

<sup>2</sup> We are not unmindful of what we said on page 22.

as they perish or are consumed in use and the rate of renewal required to maintain a given stock of things equals the rate of consumption, decay or dissipation. The rate of consumption or decay and, therefore, the rate of the necessary renewal of any resource is the reciprocal of its durability. If a house lasts fifty years on the average, then the average rate of renewal of a quantity of similar houses must be  $1/50$ th or 2 per cent of the number per annum because 2 per cent represents the annual consumption or decay. If flowers last for one day only, and a constant stock is required, then it is necessary to renew them 365 times in a year: the rate of consumption is 365 times per annum, or 36,500 per cent per annum.

This may be expressed in the formula

$$\frac{\text{Output per annum necessary to maintain stock}}{\text{Stock to be maintained}} = \frac{100}{\text{Durability in years}} \% \text{ p a.}$$

The significance of this is seen when we consider the effects on output of a change in the quantity of stock to be carried or equipment to be employed. When a change of this kind is taking place its effects are similar to a change in the rate of consumption: an increase of stock demands an increase of output as if consumption had been increased, and a decrease of stock demands a decrease of output as if durability had been increased. We can illustrate this by reference to the two examples, houses and flowers.

If a new demand for houses requires a 10 per cent increase in total numbers then the output of house-builders in the year (say) must be equal to 10 per cent of the total in existence. The builders, however, are organized to deal with an annual supply of 2 per cent (average durability being 50 years), so this new demand requires an immediate increase of output five times as large as before, or an increase of 500 per cent in the normal building output. If, on the other hand, an increase of 10 per cent is demanded in the quantity of flowers a person uses for domestic decoration an increase of 10 per cent in the output of flowers will meet it. The rate of renewal is 36,500 per cent per annum, or 365 times the stock: the increase is 10 per cent of this or 365 times the stock: therefore the expansion of output is just 10 per cent per annum.

This fact may be stated in the form of a general proposition, somewhat in the nature of a law of physical necessity. *The effect on the current rate of production of a change in the stock of any commodity to be carried or employed varies in violence with the durability of that commodity*<sup>1</sup> The greater the durability the greater the violence of the consequential change. If things were absolutely durable or lasted for ever then the change of output necessitated

<sup>1</sup> See Robertson, D. H., *Industrial Fluctuations*.

by a change of stock would be infinite: if they were very perishable, then the rate of change of output would equal the change of stock to be employed. In fact, of course, there is nothing absolutely durable in nature; all things disintegrate more or less rapidly and this law is therefore universally applicable.

A very interesting—and serious—case in which this law operates is seen in fashion trades. Let us take the case of lace, for example. The demand for lace in the pattern of living is a violently fluctuating one. For certain kinds a shrinkage of 50 per cent or more in a year or so may take place. The durability in use of lace is not great and so there is a shrinkage in the number of machines required of something approaching the same figure. When machines are thrown into idleness in this way there is a reduction in the number of renewals ordered. Machines, however, are very durable and, consequently, a large reduction in demand for machines may mean a really stupendous reduction in machine building activity. During the recent depression lace-machine building has practically ceased and throughout the history of the lace trade the machine builders have suffered even more violently than the lace makers. In times of boom, the reverse conditions hold, of course.

The respect for durability as such is not meritorious: it can be very foolish. It is waste to produce at a cost durability of physical qualities which is greater than the durability of desire. In a world that changes its mind regarding what it wants, natural perishability seems to be a circumstance of good fortune. The ideal—if such a mode of speech may be allowed in an economic work—would seem to be that man should have power to vary the durability (or perishability) of things and patterns at his will. The tendency of manufacturers to produce very durable goods when the desire for them is likely to change before they are worn out—clothes of various kinds and furnishings—tends to cause an accumulation of unworn but useless commodities. In so far as the durability has been produced at no extra cost this is a matter of no significance, but in so far as it has cost any labour and materials that might have been otherwise employed it is obvious that this extra cost has been wasted.

The continuity of a pattern of resources, all of which perish sooner or later, is, as we have shown, dependent upon the power of replacement which man possesses. In some cases (cultivated animal and vegetable produce for example), it is conceivable that in a given area a certain steady annual output may be maintained for an indefinite period but in others (oil, coal, and minerals generally) the supply is limited, exhaustible and irreplaceable. Even in the former case consumption may be so effected that its rate of dissipation

exceeds the rate of replacement: when such a maladjustment occurs it becomes a case comparable with the utilization of exhaustible and irreplaceable resources.

When the rate of consumption is greater than the rate of replacement, sooner or later the stocks or productivity must diminish. In the case of coal, since its reproduction cannot be effected, use will ultimately dissipate all of it. In the case of fish in the sea, if the rate of removal exceeds the rate of reproduction of the fish the time will arrive when there is no fish to remove. If beef is

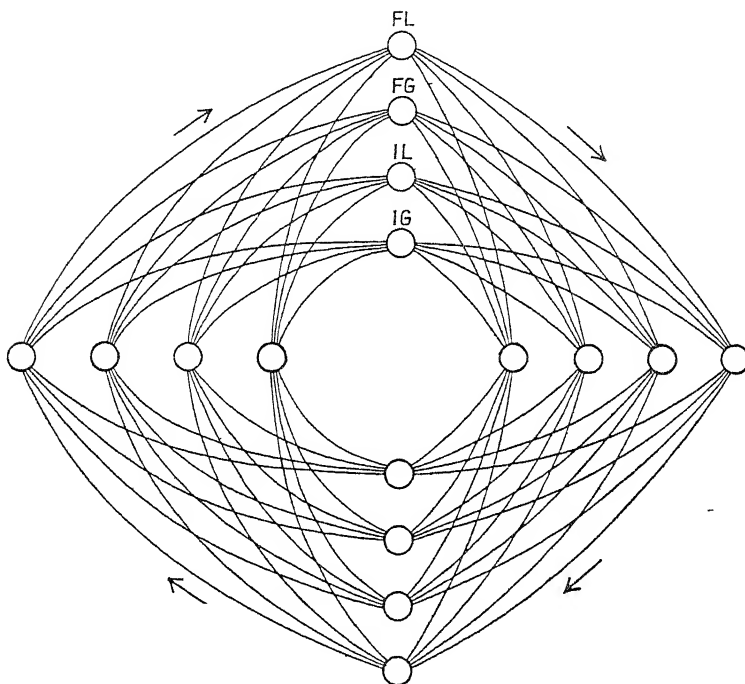


DIAGRAM C

eaten at a greater rate than new animals are born the cattle of the world will disappear. If farmers do not return seed and manure, the crop diminishes. All these cases may be regarded as cases of "exploitation". When consumption and replacement are balanced we have what may be regarded as "cultivation".

At present, man is existing by the exploitation of Nature, using, very largely, resources which he does not return in a form available for re-employment, though he has adopted various ways of avoiding the stringency that exploitation brings in time. In the first place, he has tried substitution, of coal for wood, in the second place,



he has tried to produce synthetic resources, synthetic silk and rubber; thirdly, he has attacked the problem of waste in order to reduce the rate of consumption relatively to the rate of replacement, by recovering useful resources from waste products.

The ideal at which he aims is to prevent the dissipation of energies into the limbo of unavailable resources. It is "conceivable" in the manner of dreams, that a time might come when all the energies are "returned to Nature" in such a form that they may be re-utilized; in this case, raw materials will all become intermediate goods. Such a condition is shown in Diagram C, which is similar to Diagram B in all respects but one, namely, that the central circle, representing raw materials, disappears<sup>1</sup>

There is no doubt that this matter of replaceability was another point which exercised the minds of the Physiocrats. Their hesitation in classifying mining and fishing as "productive" activities seems to suggest this. In the activities of ordinary husbandry there was seen the possibility of a continuative existence so long as consumption of food did not exceed its production. Mining was not an activity that could persist indefinitely, and so was exploitative. Fishing caused difficulty because replacement depended upon the breeding capacity of fish: consumption was a humanly controlled rate, but production of fish was not.

We must now consider another aspect of Diagram B. Assuming again that the pattern at any given moment is the group of circles on one of the radii or, alternatively, assuming the "flow pattern" as the stream of resource-time units indicated in the lines, we must discuss the physical conditions that determine the possibility of changing the proportions of these constituent groups.

The first fact that we must note is one which we have already indicated, that when any change whatever is made in the pattern of resources there is involved a deflection of labour from some current allocation. The labour may be occupied in leisure pursuits ("final" labour) or in "intermediate" employment; any alteration will require labour to be turned from one or other or both of these

<sup>1</sup> Though this diagram is the "stuff of dreams", a perfectly stationary economy (an economy in perfect equilibrium but "alive") must assume this condition of things, for only on this assumption can a single pattern persist—See Wicksell, K, *Lectures on Political Economy*, I, p. 151

There are three ways in which a "physical" scheme of disposition can conceivably persist: (a) if every atom of matter stands still (including every person), this assumes an immortality of place location of all atoms. a "frozen universe" (b) if, as every change occurs, another change takes place bringing it back to the original. Perhaps this is not conceivable (c) if a pattern through a period of time repeats itself exactly a "cyclic universe". This third is, perhaps, the most "reasonable" conception of a stationary economy in which there is movement. In this case we could regard "the beginning" as the beginning of a cycle!—See Nurske, R, loc cit

uses. Along with the labour so deflected there will necessarily be a re-allocation of the things with which it is operating and the things with which it is to operate in its new employment

A word of caution in interpreting the diagram is necessary. Labour is put into two broad categories, final and intermediate, and so are goods produced. In fact, this is a simplification. Each of the streams flowing into each of the circles is really a number of streams and, consequently, a great deal of variation of the general pattern of living is possible without altering these general flows. In other words, changes may take the form of instrumental labour being deflected from the production of one type of instrumental goods to another or from one type of final goods to another, and these possibilities of change are not shown in the diagram. And so may final labour, instrumental and final goods, as well as raw materials, be deflected in use within these broad categories. A realization of this is important because it makes clear that not all increases of certain specific kinds of instrumental goods require reductions in the production of final goods as is sometimes thought<sup>1</sup>. The necessity for transference is clear, but a new demand for certain kinds of goods may be met by a release of resources from the production of other kinds of the same order.

Changes in the structure of the flow or allocations must be either (a) transference of labour and/or goods from employment within a certain *order* or (b) transference from one *order* to another. The diagram does not show the former possibilities—hence the caution given above—but it does show the latter. The latter changes we may interpret as making the scheme more or less “instrumental” or, as is more commonly said, more *capitalistic*.<sup>2</sup> The economic structure becomes more capitalistic when there is a deflection of labour and other resources away from the “final” stages of economic activity towards the “earlier” stages. In times of boom, when resources are directed towards the primary industries in increasing amounts, the structure becomes more capitalistic<sup>3</sup>.

A few examples of the kind of transference of employment of resources which make the system more capitalistic will serve to make the conception clearer. A transference of *workers* from the distributive trades to the production of the equipment used in distribution (counters, scales, distribution vans); a transference from these trades to the production of the means of producing the

<sup>1</sup> Cf. Fisher, A. G. B., “Capital and the Growth of Knowledge,” *Economic Journal*, Sept., 1933, pp. 381–2.

<sup>2</sup> Bohm-Bawerk, E. von, *The Positive Theory of Capital*—Hayek, F. A. von, *Prices and Production*.

<sup>3</sup> Hayek, F. A. von, *Prices and Production*, p. 53.

means of distribution (planing machines, stamping machines, iron and steel production). the transference of "final" labour (leisure) to work in industry, as in "overtime", employment of hitherto "unemployed" workers: the transference of labour from unskilled employment to apprenticeship in some skilled occupation, a transference of *external resources* such as wood-working machines from the making of factory fitments to the making of household furniture; of coal from domestic uses to industry; of motors from personal use to trade purposes, of leather from shoes to machine-beltting.

As we said above, when labour and resources are transferred from one point in the structure to another, they are frequently *accompanied* by others. When machines, for instance, are moved, petrol and fuel generally must also be transferred, when men move, their food must be "moved". This fact makes clear that the increasing capitalistic nature of the economic structure demands imperatively that there shall be a conversion of food from the "lower" to the "higher" categories, from the rank of final or nearly final to that of the "more instrumental". This is what the earlier economists had in mind when they thought of capital as a *subsistence fund*,<sup>1</sup> the means necessary to maintain workers during the time of production. In our scheme of ideas we see this necessity as an increasing flow of food in the "instrumental" category.

By treating leisure as "final" labour and regarding it, therefore, at any moment, as allocated, whether this leisure be "voluntary" or "involuntary", we are able to see in its correct perspective what is meant by a "reserve" of unused labour. Strictly speaking, there is never at any moment, any such reserve. The only way of considering any labour as in reserve is to make it reserved for some specific purpose or purposes. Thus, if we arbitrarily decide to call the industrial system the economic system and exclude from the category of employment a person's leisure hours, then this leisure-labour is a reserve on which industry can fall when it requires to do so. In the same way, when one industry is in the habit of expanding employment during a season at the expense of others—by withdrawing labour, that is—then that labour which is capable of being withdrawn is a reserve. Soldiers "in reserve" are not idle. From this it follows that if an economist decides that he will identify the industrial and economic systems he must, of necessity, accept the fact that there is at any moment, a *reserve* of labour. And from this it follows, further, that he must consider

<sup>1</sup> Jevons, W. S., *The Theory of Political Economy*, p. 242. Cf. also Böhm-Bawerk, *op. cit.*

the possibility of an expansion of employment at one point in the system without a transference from some other point

From the purely "physical" point of view, from which we are at present examining human activity, it is necessary to include all activity and reject the notion of a reserve of labour—or any other resources "Unemployment" is not, then, "no employment" or "idleness", but an "alternative employment", and industrial fluctuations are not so much variations in total employment or total productive activity as changes in the relative magnitudes of activity streams.<sup>1</sup>

In the introductory chapter of this book we stated that one of the essential conditions of pattern making or changing was the possibility of disposing of resources in alternative ways.<sup>2</sup> This possibility is described by economists in various ways as *transferability*, *convertibility*, *mobility*, *non-specificity*. the particular term employed in any context is determined by the convenience of exposition. Resources, then, may be classified into two broad categories, those which are capable of alternative dispositions and those which are not, and we may apply to these categories the terms *specific* and *non-specific*.<sup>3</sup> We must use the qualifying term "broad" in connection with these categories, for many resources are capable of being converted only through periods of time and are, therefore, specific over short periods and non-specific over long periods

This quality of resources is of prime importance in the consideration of what has recently become known as "technological unemployment". When a change of the pattern of production is demanded, a reallocation of resources is required. This amounts to the double process of "disemploying" resources in some ways and re-employing them in other ways. The extent to which resources are specific and incapable of re-employment in the new ways

<sup>1</sup> Pigou, A. C., *Industrial Fluctuations*, introd. See the same author's *Unemployment*, p. 13, for the meaning of unemployment. "It is simply a question of the precise sense in which it is most convenient to use a particular common word."

<sup>2</sup> See above, p. 4

<sup>3</sup> So long as any single movement can be effected by a person, *all* resources are, strictly speaking, capable of alternative dispositions, since dispositions of things are *relationships*. The qualities of specificity and non-specificity seem to be regarded usually as "absolutes"—form, location, and ability—so that a joiner, for instance, is specific because he cannot turn weaver. The distinction between *absolute* mobility and *relative* mobility should be noted carefully. There can be no relative mobility without some absolute mobility, but many things can be relatively mobile without being absolutely mobile so long as something (or body) else is absolutely mobile. Non-specificity (or immobility) is, probably, from the economic point of view, the lack of 'ability' on the part of a resource of any kind, to regain the significance any change may cause it to lose. Here, we are dealing with physical conditions only.

demand is the measure of "technological unemployment". This kind of unemployment or disemployment may be visited upon labour and other real resources, such as land, buildings, machines. When disemployed they may be regarded, in our diagram, as being transferred, in the case of labour, to the category of "final labour" or "leisure" employment; in the case of other real resources they are returned to the category of "raw materials".

The production of instrumental goods has another aspect. It is implicit in the term "instrumental" that the goods or patterns produced are produced for the sake of some other goods or patterns in the *future*.

Strictly speaking, all production is for the future. Even when a boy collects and eats wild berries the collection precedes the eating: it may be that the future is an infinitesimally small period of time ahead, yet it is the future. All production activity, however, is actually in the present. The physical process of production must, therefore, consist of a succession of present patterns directed to the more or less distant future and, from this, it follows that the decision to provide for the more distant future involves the restriction of or withdrawal from the provision for the less distant future. If, for any reason, there is desired an increased provision for all the future it is clear that "saving" must be effected, a restriction of production for the present in favour of the future. An enhancement of the "capitalistic" nature of production may then be regarded as a shrinking of the quantity of resources employed for present or immediate future uses and a lengthening of the time period<sup>1</sup> in the future to which men devote their present activities and resources.

Time is one of the dimensions of the pattern of living which every man weaves. The pattern which he has in mind as he weaves at any moment is perforce a future pattern. Since his weaving is always done in the present we may consider him standing, so to speak, at the "present" end of his designing board, reaching along into the future and "placing" his resources in temporal juxtapositions. If he persists in reaching far along the board he cannot, in the nature of things, place his resources at the near end. The pattern he weaves is, however, a continuous one from the present out into the future. It is impossible that he should make all his allocations of resources for the distant future because he would thereby break the necessary connection and die; his pattern of living would thus cease and the resources would enter somebody else's pattern. This physical necessity for provision for the

<sup>1</sup> That is, period of investment. See note on Period of Investment at the end of this chapter, pp 77, et seq

immediate future is a limitation within which he is bound to operate. He may make that part of his pattern which lies in the immediate future rather " skimpily " so that he can make the part in the more distant future more elaborately, but there is a minimum below which he cannot go

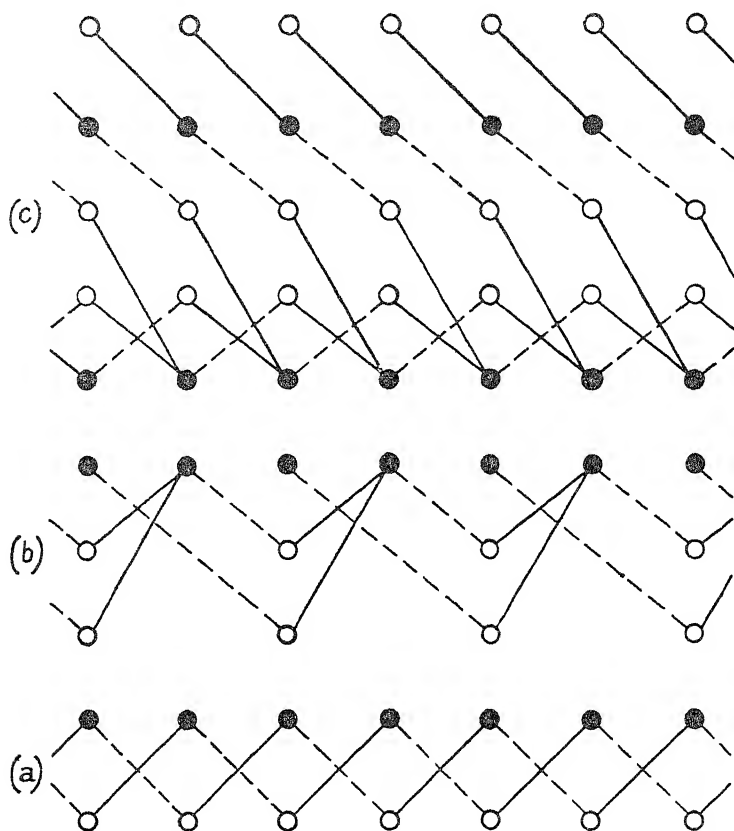


DIAGRAM D

A certain amount of provision for the immediate future may inevitably produce a situation that is of rather more " distant " value also. Buildings for an exhibition, though only required, say, for six weeks, may be built in a manner that will provide a possible use for several years. But to the extent that provision for the distant future is deliberate it is effected at the cost of the more immediate future.

The condition which we have just considered may be stated in another way. Provision for the distant future is only possible when the power of production for the immediate future is in excess of that required for consumption in the immediate future.<sup>1</sup> We may express it in terms of flow by saying that the provision for the future depends upon current consumption being less than current production. If a person can only just provide himself with current needs he has no power to produce for the future. The needs may be physical needs such as food and clothing, or conventional needs, or luxury needs. The more he requires immediately the less he can have in the future.

Diagram D (a) shows the position of a man whose current production of necessities is just equal to his current consumption. The black dots represent days of work in succession from the right to the left. the full lines show his production of food represented by circles and the broken lines show the consumption of food in his maintenance during a day. Diagram D (b) illustrates the case in which a man produces food enough for two days and the result is that alternate days are available for leisure or other occupations.

Diagram D (c) shows another possible situation. Here there are two men indicated by two rows of labour-days. The one below produces food for two each day, the second man's labour being available for some other purpose. This purpose may be provision of a second current need—a physical necessary, a conventional necessary, or a luxury—or some future requirement.

This diagram (D (c)) shows the situation which the Physiocrats<sup>2</sup> and their Classical<sup>3</sup> successors should have envisaged. It shows that if some men can produce sufficient of the necessities for the immediate future of all men then the others can be maintained in any other kind of work so long as this condition lasts. If the desirable objective is an increase of instrumental goods, these "surpluses" must be assigned to their production; if the desirable objective is a gay life then they can be assigned to the production of gaiety. The variety of occupation to which men can be assigned depends upon the energy available after the provision of necessities dictated by Nature or by man's decree, just as the provision for the future depends upon the surplus available when current "necessary" consumption is met. The surplus of food which farmers produce is not a peculiar characteristic of farmers, if bootmakers cannot make more boots than they need for themselves and the producers

<sup>1</sup> Ricardo, D, *Principles of Political Economy*, p. 94 (Everyman ed.): "When the annual productions of a country more than replace its annual consumption it is said to increase its capital."

<sup>2</sup> The basic idea of "produit net"

<sup>3</sup> See Cannan, E, *Theories of Production and Distribution*, ch. iv, "Capital"

of food as well, (and food and boots are both required), then it follows that nothing but food and boots can be produced.

We have indicated the condition of variety of product and variety of time allocation of resources ; there is still another feature of the social pattern which must be similarly accounted for. The pattern of living we may say has a space dimension as well as a time dimension. Control of the distribution of things through space is a matter of physical control over space. Time spent on travelling or hauling things over long distances is withdrawn from other purposes. It is physically impossible for a person to be in London and Adelaide in successive moments of time and, consequently, labour is required to effect the necessary movement. Goods are not carried from London to Adelaide for the simple sake of carrying them ; therefore, other things being equal, travelling time and labour in travelling will be eliminated as far as possible. If man, like the frigate bird, had " to breakfast on the Senegal and dine in America " he would, unless he had the speed of the frigate bird, find himself of necessity missing one of his meals daily and so being impaired. The economy of transportation is a mode of releasing energy for other purposes. This is why a person lives in a " locality ", spending his time, mostly, in a particular, somewhat limited, area.

Most of what we have said hitherto has been presented as if we were discussing the actions of a single person. We have referred to " man " in general terms and, though we have occasionally discussed matters concerning social organization, we have not directed special attention to the physical aspect of pattern making where two or more, forming a community, are operating in the same area. This we must now proceed to do.

The " physical significance " of more than one person living in one area, or interested in the administration of the same resources, is that there are two or more physical controls operating towards patterns in two or more mounds. This multiplicity of controls leads to " overlapping " of patterns and the overlapping leads to one of two relations between the controlling persons, conflict or co-operation. From the purely " physical " point of view we cannot, of course, decide whether activities are conflicting or co-operative ; all that we can say is that, by conflict or co-operation, the activities of the several controllers produce a " joint pattern ", that is, a disposition of resources that is due to the interaction of the two pattern makers, and that the joint pattern is different from what it would be if only one operated. Useful discussion of the position must assume, however, an understanding of the difference between conflict and co-operation.

If we assume this difference to be understood we can say that



in the case of conflict a certain quantity of energy and material is employed in "settling the conflict" and that, when it is settled, there is a release of this energy and material for other purposes. In co-operation there is no expenditure on determining the rights to use resources. In conflict, A spends resources in preventing B doing what A himself does not want done, likewise B spends resources in preventing A doing something of which B disapproves. In co-operation this "waste" is avoided. Conflict is mutual thwarting and co-operation is mutual improvement, conflict and co-operation are, as it were, "negative" and "positive" to each other<sup>1</sup>

From the point of view of a single "pattern maker" we realize at once that many of his activities are of the type that we have described as "instrumental", and if he could attain his end without them he would. There are many such activities and when men co-operate they eliminate many of them, thus effecting a release of resources for other purposes. There are, in addition, some things that can be done if two persons work simultaneously that could not possibly be done in any length of time by one person alone; for example, a single man cannot lift above a certain weight and two men, pulling, say, on a rope, can lift a larger weight than either separately.

Further, it may be said that one person can produce a more satisfactory result in one process and the other in another process, so that a better combined result is obtained, for example, one may grow better potatoes than another and the other better cabbages than the one, and by co-operating to produce potatoes and cabbages they can attain a standard that neither could have attained separately.

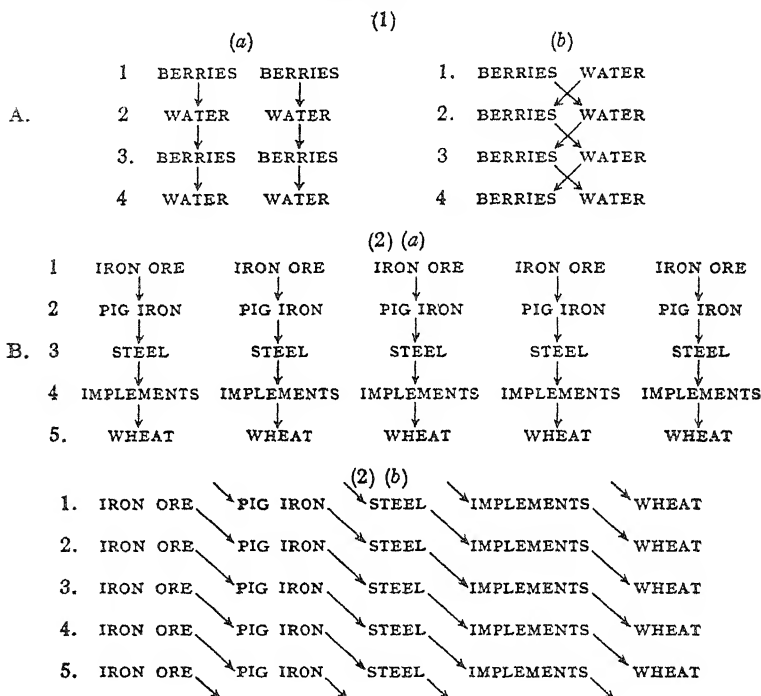
Perhaps the most significant feature of co-operative pattern making as compared with individual pattern making is that which reveals the possibility of a variety of processes taking place *concurrently* and not *consecutively*.<sup>2</sup> We have already shown that an individual can only do one thing at a time and if he wants several things done he must do them consecutively. We also showed that in order to produce variety he must always, at one point of time, make possible his living while he does something else in the next moment of time. Variety, then, to an individual, requires a current consumption that is less than current production and requires a carrying forward of stocks. The members of a co-operative organization can consume concurrently the whole of their production, and

<sup>1</sup> We here assume "exchange" to be co-operation, as it is from the "physical" point of view. See Appendix.

<sup>2</sup> See note on "Period of Production", p. 77.

though at any moment there must be a stock that will satisfy all immediate wants yet the stock need not be durable beyond the period between, say, one harvest and the next because it is continually consumed.<sup>1</sup> Another way of expressing this difference between a co-operative organization and a single control or individual organization is to say that, in the former, we can speak of a scheme of allocation of labour at a *moment of time* and *over*

DIAGRAM E



a *period of time* while in the latter we can only speak of a scheme of allocation over a *period of time*.

At this juncture it will be convenient to use the conception of final and instrumental products. Co-operation makes possible the simultaneous and continuous production and consumption of (a) a variety of final goods only (as in a very primitive society)

<sup>1</sup> Each person in the group must be able to produce more of his own specific product than he requires himself even when the group consumes its whole production immediately

or (b) a variety of final and instrumental goods. The elimination of the necessity for carrying stocks of things is even more significant when we consider the concurrent production of all stages of commodities. It means that machines and all other instrumental or intermediate goods can be employed continuously with no "waste" of materials and energies. Co-operation is not necessary to the employment of roundabout methods of production, but it makes them more effective by eliminating the waste of things "standing idle", a waste which cannot be avoided when an individual producing for himself aspires to anything in the nature of an elaborate style of living.

Diagram E presents the situation visually. The pair of diagrams E (1) (a and b) shows the situation with regard to two consumable commodities, the former showing the case of one individual first producing berries, then water, berries, water, etc., and the other individual working similarly, the latter shows the two persons specializing and supplying each other concurrently with their productions. By saving the labour of moving from one occupation to another they are able to produce larger quantities probably, but they are able to produce variety simultaneously, which an individual cannot do. Diagrams E (2) (a and b) show the position with regard to instrumental and final commodities. The former shows the position when each person produces at all stages and the second shows the position when they specialize. In the first case each person keeps transferring from one process to another, leaving the appropriate equipment of each stage, while in the second case all processes are continuous and the diagonal lines show the movement of the material through the various stages. Final goods and instrumental can be multiplied and we have a diagrammatic conception of the economic system. The situation has been described as a "synchronized scheme of processes" <sup>1</sup> By putting the locations of the mines, farms, etc., in place of the commodities in various stages of production we could produce a diagram showing geographical specialization and so show that in situation as well as in personnel the "best" resources can be worked for all processes through co-operation. Economists discuss this aspect of the economic structure under the various names of specialization, division of labour, separation of employments, localization of industries.<sup>2</sup>

We are now in a position to take a general view of human living as a changing pattern of material resources. The changes are perpetual and they arise from changes in the minds of men who are

<sup>1</sup> See Clark, J. B., *The Distribution of Wealth*, ch. xx. Also Hayek, *Prices and Production*, p. 37.

<sup>2</sup> Smith, A., *Wealth of Nations*. Bk. I, chs. 1, 2, 3.

controlling them or from changes in the material resources themselves. Some of the changes in resources are consequences of changes made by man, but some of them take place "on their own account" and really present man with new circumstances with which he must contend. It is a moot point whether all changes in the human mind are determined by experience, but to the extent that they are, then the process of change is completely automatic. Experience gives new ideas, and new activities arising from new ideas give new experience.

The first change that we may consider is that which continually takes place in numbers. This change is significant to the economist because it introduces a change in the number of points at which the "joint pattern"—or social pattern—may be controlled or, in other words, affects the possibilities of co-operation (and conflict). It is perfectly clear from what has been said that co-operation can increase the pattern making possibilities of a group, but it is equally obvious that in any given territory or with any given scheme of resources it is impossible to co-operate with advantage beyond a certain point. "Too many cooks spoil the broth" is a domestic adage of universal application. The optimum size of a population<sup>1</sup> is that which makes possible the maximum economies that co-operation can effect.

What the optimum population is at any moment nobody can calculate,<sup>2</sup> but we can say with certainty that it varies through time with variations in knowledge, standards of living desired, and the resources available. The conception of optimum is a conception of "best", it is a qualitative conception and so it cannot be defined in physical terms. All that we can say from the physical point of view is that a change of numbers may, in the pursuit of a given scheme of standards of living, make possible an easier attainment of the standard through the change in the possible organization of labour at any moment of time; it may also make the attainment of the standard more difficult, ease and difficulty being interpreted simply as the quantity of physical effort required to perform a certain act or acquire a given quantity of some commodity.

The population problem has a qualitative, as well as a quantitative aspect. Changes in the quality of people affect the advantages of co-operation by affecting the scheme of possible specialization. Changes in physical strength, in intelligence, in knowledge, and

<sup>1</sup> Cannan, E., *Wealth*, pp 68-70. Carr-Saunders, A. M., *The Population Problem*, pp 201-3. Dalton, H., "The Theory of Population," *Economica*, 1928. Robbins, L., "The Optimum Theory of Population" (*London Essays in Economics*, edit. by Dalton, H., and Gregory, T. E.)

<sup>2</sup> Dalton, H., loc. cit.

skill—general changes or distributional changes—are similar to changes in numbers, in that they affect the possibilities of co-operation.

Besides changes in quantity and quality of human resources, changes in quantity and quality of non-human resources also take place. As we have said, some of these changes are the result of past activities of human beings and some of them are changes that have taken place independently of man. In the latter category are changes wrought by climate, earthquake, sea erosion, floods, insect pests, disease, and such like natural phenomena. In the former category are the changes in equipment—buildings, machines, roads, railways, canals—and changes effected by the extraction of exhaustible resources such as coal, oil, metals.

These are changes to which man must continually adapt himself. Some of them increase the freedom to use resources owing to their being changes of advantage to present generations: some are interferences with this freedom since they are changes which man at any moment would have preferred not done. From a simple "physical" point of view these changes cannot be evaluated: all that can be said is that the pattern of resources at any moment is what it is largely owing to these past events. In fact, at any given moment, it is wholly due to past events and man can only act on the pattern that exists.

Changes in durability of resources and changes in their replaceability are simply special points noted in this aspect of the change in man's resources. An increase of durability may be an increase of freedom or a decrease of freedom. It depends upon the desires of men to take advantage of the increased durability. Changes in replaceability may be of no account if they are in things that are of no present account, but if they are desired then it is a significant matter if the replacement of wasting or perishable assets requires more or less labour to effect.

Knowledge, the light of understanding within which men administer their resources, is a quality of men. It is sometimes said that knowledge lies in books, but this is not strictly correct. Knowledge is that which is known—it is an understanding which can only exist in the mind of man. To the person who knows, the power to control resources is greater. He has more power of adapting himself and his environment, or more power of attaining an end.<sup>1</sup>

The effect of knowledge on the distribution of freedom lies outside

<sup>1</sup> Cannan, E., (a) *Rev of Econ Th*, pp 122–5. (b) "Capital and the Heritage of Improvement," *Economica*, 1934, pp 381, et seq. Wallas, Graham, *Our Social Heritage*, pp 15–54 especially.

the scope of this chapter. Changes in knowledge can only be regarded here as changes in qualities of men and these changes in qualities affect the possibilities of pattern making to individuals and, also, the possibilities of co-operation. It is obvious to all that the increase of knowledge of the behaviour of material things has led to the possibility of doing many things which were before impossible. Engineering, manufacturing, transportation, medicine, surgery—all these have advanced as the result of the increase of knowledge—knowledge of mind and skill ("knowledge of hand"). The increase of knowledge has led to a more elaborate pattern making in society: it has given men greater power over Nature. Incidentally, the growth of knowledge and its distribution affects the distribution of control in the system. It would be incorrect to say that knowledge has only had the effect of increasing human liberty, knowledge includes knowledge of men and the distribution of this knowledge in some cases leads to extended control, by some persons, of others, which means that some persons may lose freedom.<sup>1</sup> The influence of knowledge in the field of destruction, of war, say, is, perhaps an increase of freedom to those who hold the superior power, but to those who are not in this position it is, perhaps, a loss of freedom. The changes in the distribution of knowledge might lead, then, to the resort to conflict and so check the development of co-operation.

All the changes we have spoken of hitherto are changes in the nature of the resources which man employs: they are changes in the material resources external to man and changes in the numbers and qualities of men themselves. The other great changing factor in the process of pattern making is the factor of human desire. Human desires are not resources, they are not things that are used; they are psychological dispositions. Changing desires, like the changing qualities and quantities of the resources employed, are significant because they lead to reallocations of resources, including labour.

These changes in resources and changes in desires are known sometimes as the dynamic element in the economic order. They lead to reallocations of resources, and the former, like the latter, are liable to cause a change in the social relationship from co-operation to conflict or vice versa.

<sup>1</sup> Veblen, T., *Vested Interests*, pp 68–9.

## NOTE ON PERIOD OF INVESTMENT

It must be noted that we are here discussing *physical* conditions only, therefore we mean by *period of investment* the period of time elapsing between the moment when physical resources are allocated towards an end and the moment when that end is attained (or expected to be attained).

To understand what is meant precisely by "period of investment" in this "physical" sense we must first define a unit of resource invested

There are two ways in which "resources employed" are defined. In the first place we consider a unit of labour as a man, a unit of coal as a ton, a unit of machinery as an engine and a unit of land as an acre. In the second place, we speak of man-hours, engine-hours, acre-years, and ton-hours. From our point of view we *must* use the second type of unit, for a thing cannot be disposed of except through time. Regarding the quantity of material as one dimension and time as another, our resource unit is two-dimensional, it is a unit of "disposal" (see Cassel, G., *The Theory of Social Economy*, p. 184). More usually this conception is employed in the measurement of service, but since service is a relationship we must think of this unit of resource as a "unit of persistence of a given physical form".

Let us now suppose a person working in his garden for a week for a crop of flowers to be cut twelve months hence. Let us regard the week as seven days and the year as 365 days. The first "man-day" is invested for 365 days, the second for 364 days, the third 363, and so on. The *average time of investment* of this man's labour is  $365 + 364 + 363 + 362 + 361 + 360 + 359$ , divided by 7, that is, 362 days. (See Jevons, W. S., *Theory of Political Economy*, pp. 249-252, Böhm-Bawerk, E. von, *The Positive Theory of Capital*, bk. II, chs. 2 and 3, Hayek, F. A. von, "On the Relationship between Investment and Output," *Econ. Journal*, 1934, for the mathematical conception.) The divisor, 7, is two dimensional, 7 *man-days*, the quotient 362 is one dimensional, *days*; the dividend, 2,534 is three dimensional, "man-day days". Each day's work may be regarded as "lying in the garden" and accumulating into an *amount of investment*. (These conceptions should be compared with those of Jevons, W. S., loc. cit., where he uses them in connection with "capital".)

We thus have three quantities related, the amount of resource invested, the amount of investment of resource and the quotient of these, or the average time of investment in two, three, and one dimensions respectively.

If the commodity takes time to wear out then the "amount of investment" accumulates from the beginning of the "use" period (as distinct from the "production" period) at a diminishing rate. In Jevons' graphic phrase we have a period of *uninvestment*.

The rate at which uninvestment takes place may be variable, but if we consider a simple case in which the reduction is uniform and the resource has been invested in its production in uniform amounts, then the "average period of investment" per unit of resource is one half of the time from the first investment to the last point of dissipation (see Jevons, W. S., loc cit)

Whenever any commodity is produced, several resources are employed: all of them must be applied in two-dimensional units. Thus a joiner makes a box by using man-hours, hammer-hours, wood-hours, etc, and the *box* may be regarded, immediately it is done, as an accumulation of these various "resource-time" units, a "sum" of various "amounts of investment". These "amounts" may be regarded, in Wicksell's terminology as "saved-up resources" "saved-up labour", "saved-up hammer", "saved-up wood", etc (Wicksell, K., *Lectures on Political Economy*, pp. 144-166) The resource *invested* is, at the moment of investment, a *current* resource; the *amount of investment* being made is the "current resource  $\times$  average time of investment"

This analysis makes it clear that we may regard a product in the future as a *resource-time-structure*. When a person embarks on a course of production, he decides upon an *investment of current resources for a period of time*, and so may be considered as envisaging, as worth while, a structure consisting of current resources and a quantity of "savings". We may, therefore, point out at once the conditions of a *lengthening* of the average period of production or investment (locking up of current resources or "waiting" for production).

In the first place the period of investment may be lengthened by directing the current resources already devoted to future production to a more future end. In the second place it may be lengthened by altering the amounts of current resources invested: if these are reduced, their "end" must be postponed in greater proportion, if they are increased the end may be brought nearer or postponed, but it must not be brought nearer than such a point that the time reduction is equal to or greater than the resource increase. A lengthening of the *period of investment* involves a postponement of the average date of consummation of investment of current resources: this may mean that "immediate" results are postponed, or it may mean that future results are made more future; it may mean that the results are increased through the production of a more durable commodity

It must be observed that hitherto we have considered an individual administrator only, a Crusoe in an isolated economy. The conceptions we have defined are, however, with differences which we shall note later, employed usually in considering the socio-economic system as a whole and, further, they are employed in the study of a continuous, unchanging flow of production and consumption therein.



We have shown (on p. 71) that when men specialize they are able to maintain a continuous flow of production by performing *concurrently* processes which, by an individual, must be performed *consecutively*. In our discussion so far in this note we have considered the consecutive application of resources in the production of a single product and we have shown how the "amount of investment" in this product is made up of strings of resource-time units of varying lengths, according to the time between investment of current resources and the end of the product. It follows, then, that in a system in which a continuous flow of production is maintained by specialization we have a condition of things in which current resources are applied concurrently to ends at times ahead corresponding to those of the resources applied consecutively in a single process of production. The diagrams below (E (a) 1, 2, 3)

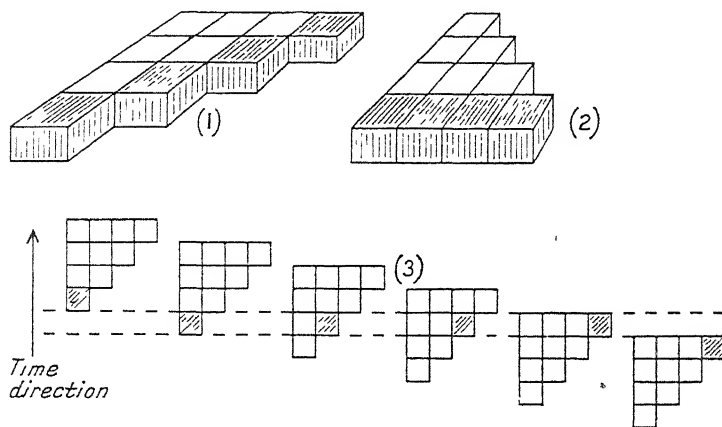


DIAGRAM E (a)

illustrate the position. In the first we see the investment of current resources at *consecutive* times by persons A, B, C, and D, the shaded blocks representing the current resources invested, the white blocks representing the "accumulation of investment". In the second diagram we have the position in a continuous specialization system. All four workers are working at their respective stages of production (on different individual products) and their investment periods are shown by the lengths of their respective "strips" of investment blocks (shaded and unshaded). The amount of fresh investment being made at any moment is, therefore, equal to the amount of investment required in each product. But in a continuous system there are, in existence, at any moment, products in all stages of production, since at each stage we have an accumulation of resource-time units up to that point, there is, at any moment

in existence a total amount of such accumulation equal to the total of all accumulations at all stages. The third diagram shows this. Each figure represents the production of a single commodity, represented as produced in four periods by four persons. The eschelon of figures represents the flow of this commodity production through time, a period of time being a horizontal strip across the eschelon. A full strip is marked off to show the position which is as follows —

(1) There are four units of current resources being applied in this time unit.

(2) They are being applied for four, three, two, and one periods respectively, so that the amount of investment being made is  $4 + 3 + 2 + 1$  resource-time units, i.e. 10. This is equal to the number of units of resource-time “locked up” in each commodity.

(3) During this period there are in existence, finished and unfinished goods embodying 10, 6, 3, 1 units of resources respectively, that is, 20 units. This is equal to the sum of all amounts of investment at all stages of production of a single commodity.

The third note presents the “time structure of production” (Hayek, F. A. von, *Econ. Journal*, 1934, loc. cit.), it might equally well be called the “time structure of present investments”. It is, as we have already shown, a structure of resource-time units, “current” and “saved” or “current” and “to be saved”. When the assumption of a continuous, unchanging economy is made it is seen that the structure of *actually made* investment (the actual accumulations of resource-time units) is equal to the investment structure *being made*. In the former case we have a “looking backward” picture of the structure and in the latter we have a “looking forward” conception.

Now, *if* the system is assumed to be continuous and unchanging it follows that *current* resources can be considered as *original* resources, in the sense that resources used at the beginning of a period of production are original to that period. This is what Bohm-Bawerk, Wicksell, and Professor Hayek do and they build up “their time structures on the assumption that these original resources are *land* and *labour*, the Classical *primary* factors of production. By looking backwards in this way these writers are able to see three “factors” of production, *land* and *labour*, in original form, and *capital* or intermediate products as Wicksell’s “saved-up” labour and land. (“We may regard capital as a single coherent mass of saved-up labour and saved-up land, which is accumulated in the course of years”; op. cit., p. 150.)

The simplicity of this conception of capital structure is very attractive but it needs to be carefully examined. As Mr Nurske says (loc. cit.), there is never found, in our actual world, the case of a man working with original land and labour, and, therefore, if we are to assume a continuous, unchanging system in which this is true and, at the same time, treat original resources as labour and land

in their "original" forms, we are on the horns of a dilemma; the stationary economy assumption requires a *repetitive* process and the assumption of land and labour only as original resources requires us to go back always to the "historical beginning", which makes all production *one* period (See note, p 56)

To the extent that there is any repetitiveness in our system (any real circularity) we may look backward and consider the structure of past investment—but it will involve our rejection of the conception of "original" resources as original land and labour and our consideration of "current resources" as consisting of any kinds of resources whatsoever. If we employ the forward-looking conception of "capital structure" we need not consider land and labour as the only original resources; the products of past investment are "original" and their services are "saved-up" in the future. This involves the rejection of "capital" as a factor consisting of saved-up original resources but it does not involve the rejection of the time-structure of current investment. This structure is a structure of intentions or expectations (See Hill, M., "The Period of Production and Industrial Fluctuations," *Econ Journal*, 1933, p 601, for the origin of this distinction. He attributes it to F. Burkhardt.)

We may now consider Professor Hayek's suggestion, of Bohm-Bawerkian origin, that a lengthening of the average period of investment of original resources is equivalent to an increase in the "capitalistic" nature of the system, in other words, "a larger proportion of available original means of production is employed to provide consumer's goods for some more or less distant future than is used for the satisfaction of immediate needs" (*Prices and Fluctuations*, p 34)

All that we need to do is to adapt the first diagram above, using the same resources but spreading them over a longer period of time. We do this below and place the "old" and "new" structures side by side (Diag. E (b)). This shows at once that in the new continuous system there is *one-fifth* of the available original resources used in the "final" stage of production as compared with *one-fourth* in the old scheme. The fact is made clearer if we place the single production schemes in eschelon as we did before: then we see that, at any given moment of time in the new scheme, only one part out of five is operating in final stages. The third diagram shows this and it may be compared with the eschelon given above.

It should be noted also in this connection that, using the backward looking conception, the lengthening of the period of production involves the reduction of the proportion between "original" resources and the "amount of invested resource-time units" at any given moment. The eschelon diagrams show that in the four-period structure this ratio is 1 to 4, while in the five-period structure it is 1 to 6.

This analysis (similar to Professor Hayek's own in Lecture III

of *Prices and Production*) shows that the suggestion of Professor Hayek is well-founded so far as it applies to a continuous, repetitive economy. It is also applicable if we turn our view into the future and do not assume a perfectly stationary economy. In the latter case, instead of thinking of the accumulations of resource-time units "up to the present" as the "amount of investment" we must consider the "intended accumulations". This at once reduces

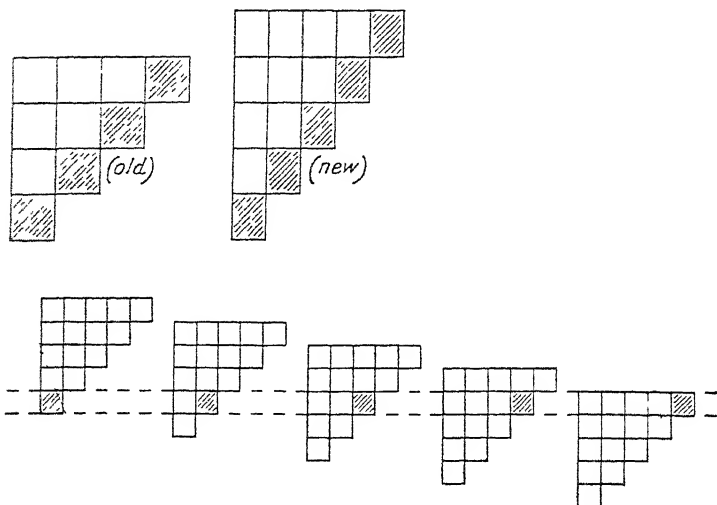


DIAGRAM E (b)

the proportion of resources available for current final use (not necessarily "original") to the resources invested, and, in the working out of the lengthened scheme, a smaller proportion of current resources will be devoted to final stages of production than would have been the case had there been no administrative change. Thus we may accept Professor Hayek's suggestion that a lengthening of the period of investment increases the "capitalistic" nature of the economic system, whether we assume stationary conditions or not.

### CHAPTER III

#### THE FLOW OF "VALUE-IN-USE"

Satisfaction we have defined as the state of mind that arises from a certain degree of adjustment between a man and his environment or the feeling associated with a pattern of resources of which he forms a part. Since this pattern of resources "avails" towards satisfaction we say that it possesses value<sup>1</sup>: an old term in economic literature is "value-in-use"<sup>2</sup> to distinguish it from "value-in-exchange"<sup>3</sup>. Being a personal experience, satisfaction must be regarded as a flow or stream of experience and the value-in-use of the patterns of resources which form the basis of living can be regarded as a stream, a stream of "availingness".

We know that every person, in the course of time, varies in the degree of satisfaction which he enjoys; in other words, the "stream" of satisfaction derived from his actual patterns of resources varies in "width and depth". This variation in satisfaction is sometimes brought about by changes in the patterns of resources *desired*, sometimes by changes in the *actual* patterns and sometimes by changes in both ways so that the actual and desired patterns do not remain in the same degree of adjustment to each other. Actual patterns of resources vary in their value-in-use according as they conform nearly or remotely to desired patterns.

It is conceivable that a person may have such powers of adjustment that actual patterns are always desired patterns, but in such a case we have, in all probability, a person who desires nothing or to whom nothing avails<sup>4</sup>. Such a person may be very ill or he may have some strong philosophical opinions that make him disregard life as it is ordinarily regarded. As we said in a previous chapter, most of us have a certain capacity to adapt our desires to our actual positions, but in general we attempt to adapt our resources to our desires.

<sup>1</sup> Cf. Ruskin, J., *Unto this Last*, essay iv, *ad valorem*.

<sup>2</sup> *Utility* is more generally used by economists and may be substituted for *value-in-use* throughout this chapter. *Desiredness*, *wantedness*, *dependence*, *significance* are alternatives used by various authorities, with intention to show subtler points.

<sup>3</sup> *Wealth of Nations*, bk. 1, ch. iv.

<sup>4</sup> "Poverty results from increase of man's desires, not from diminution of his property"—Plato, *Laws*, quoted by Bonar, J., *Philosophy and Political Economy*, p. 14.

To the economist man is perpetually seeking to establish a certain pattern of resources. It may be said that he is pursuing satisfaction, that he is continually yielding to attractions and tending towards equilibrium. It may be said that he desires to adjust himself to his environment or his environment to himself. The great economic principle is sometimes defined as the attainment of a given end with the smallest means and sometimes as the attainment of a maximum end with given means. All of these forms of expression amount to the same thing and we can consider the "driving force" or motive power of human living in any of these ways.

Stationariness in an absolute sense is impossible in this world. No economic visionary has ever contemplated a stationary state that implied perfect rest. It is impossible for the reason given in the last chapter. All material things, including man himself, change in the natural physical order of things. There are moments when men have called upon the sun to stand still, time to cease unrolling, these are the moments of great exaltation, moments when the economist would beggar the situation by saying that they were apparently in a state of equilibrium, of maximum satisfaction or perfect adjustment with their environment. But time continues to unroll, the sun proceeds in its course, things fall into decay, men grow hungry or tired and, in the longer period, they die. Physical change in man and his resources is the order to which man must conform.

Therefore, even if, for a moment, man should attain perfect equilibrium and pronounce the scheme of things in which he lives perfectly satisfactory, he would find, in a moment, that this scheme of things had lost its "availingness" towards satisfaction, had fallen in its "value-in-use". It is as if he lived on a stairway which moves downwards and he measured his satisfaction by his distance from the bottom. If he stands still for a moment he moves down the stairs and his satisfaction is reduced, he needs must work to maintain his level, to maintain any degree of satisfaction he may have attained.

This constant "slipping away" of the value-in-use of the pattern of resources in which man finds himself is the condition that makes him perpetually work and scheme. Certain physical events may take place which by chance "do" something which he wants done—as, for instance, if an earthquake or accidental fire destroys something he wants destroyed—but, in the main, he cannot depend upon this and he must, therefore, direct the process of pattern making. This involves the exertion of human energy and its direction, in short, it involves labour.

The desire for a progressive standard of satisfaction involves

this same condition of work since the desire for progress shows itself in a continuous change of desired patterns of resources, a continuous judgment, therefore, that the present scheme of things has less value-in-use than it would have if it were altered, and human labour is an absolutely essential factor in all changes of patterns.

The conception of the process of living or the process of pattern making which we wish to employ in this chapter is now perfectly clear. Man is continually applying himself to the production of a pattern of resources that will have a greater value-in-use to him than the pattern which will exist if he does not apply himself and, in order to make his patterns, he must employ labour. It is an old conception, employed by economists at all times, but the full content of the conception has not always been appreciated.

Adam Smith, employing the idea, was led to make the statement that the cost of living, the cost of producing wealth, is the exertion of labour. "The real price of everything, what everything really costs to the man who wants to acquire it, is the toil and trouble of acquiring it" <sup>1</sup> "Labour was the first price," he said in another place, "the original purchase-money that was paid for all things." To those who followed him in the Classical tradition, and to those who were not of the "orthodox" way of thinking, the statement seemed obviously true and unassailable. In the course of time the form of expression changed, but the basic idea persisted. A later expression was that labour created "utilities".

It will do this traditional mode of expression no violence if we say that the flow of value-in-use, with which we are here dealing, was considered to proceed in this way, first, man uses things, and in the process of using them destroys them, and so *destroys value-in-use* or utility, secondly, man works to replace them (or substitutes for them) and so *creates value-in-use*. (If the use does not destroy them they lose their value-in-use through decay, and labour creates more value-in-use to replace that which is lost.) The conception was, therefore, one of man destroying and creating use-value or utility <sup>2</sup>

To do justice to these writers we must point out that they doubtless meant nothing more than that labour is employed to bring materials and energies from less useful forms to more useful

<sup>1</sup> *Wealth of Nations*, bk 1, ch v

<sup>2</sup> "By production we are not to understand the production of matter, for that is the exclusive attribute of Omnipotence, but the production of *utility*" (p. 61) "In like manner, by consumption is not meant the consumption or annihilation of matter, for that is equally impossible as its creation, but merely the *consumption or annihilation of those qualities which render commodities useful and desirable*" (p. 390, M'Culloch, J. R., *Principles of Pol Econ*, 1825)

ones, but in their modes of expression they carried forward the tradition that labour creates and man destroys use-value. And this is a tradition that needs to be killed for several reasons

In the first place, labour creates nothing, it is man who "creates" or produces, and man is not labour. Labour is the exertion of human energy in some particular direction presided over by man; the producer is the "ego" which lies behind the body and its activities. Man indeed does not "create" material things at all, but he does make patterns; he directs labour in the arrangement of things. In the second place, labour is not the only form of energy which man employs. He cannot make a pair of boots without leather or some such material, and consequently, it is as inaccurate to say that labour makes boots as to say that leather makes boots. Man, employing labour, a machine, leather, and other things, makes boots. All energy, human and non-human, must be put on the same plane as resources.

In the third place, utility is not and cannot be made; it grows, like Topsy, and man *sees* it. Value-in-use appears as a quality of things through man realizing that from certain dispositions of material resources he can derive more satisfaction than he can derive from other dispositions. Thus, his seeing that labour, machines, leather and thread, in a certain physical juxtaposition, can result in boots (just as hydrogen and oxygen in certain conditions can result in water) confers on the labour, the machines, leather and thread the quality of being useful because they result in boots which are useful. True it is that labour enters as a resource into the making of all patterns but, in the first place, it must always be associated in use with something else and, in the second place it, like these other resources with which it is associated, has the quality of being valuable-in-use *conferred upon it*

Having disposed of the idea that labour produces utility or use-value or, indeed, anything at all, since it is man who produces, and he employs his own energy, his own personal resources (in the form we call labour), along with other resources, we have disposed of the idea that the cost of living is human labour. To make the point more certain, however, we must consider other misconceptions, and ambiguities that breed misconceptions, employed by Smith and his successors down till most recent times. The consideration of these will make clear the modern conception of the *real cost* of living

Smith made a contrast between labour and leisure, effort and effortlessness. The performance of work was the incurring of "toil and trouble" and the sacrifice of leisure; the sacrifice of leisure was the sacrifice of "ease, liberty, and happiness". To do nothing, it



would seem, was bliss, and to work was painful<sup>1</sup> That work might be pleasant and leisure might be boring was exceptional. It is often difficult to pin Smith down to any clear theory, but in this case it does seem possible to explain his basic idea and his basic error.

In the first place he argued that the value of labour to the labourer was the "ease, liberty, and happiness" whose sacrifice the labour entailed. In this, then, he considered that the value (and, therefore, when sacrificed, the *cost*) of labour was measured by the enjoyment or satisfaction he derived from the alternative use of his time. This means that he held that the cost of one allocation of his energy and time was the sacrifice of the satisfaction derived from the alternative allocation. (That is the modern conception. Whether labour is painful and leisure pleasant is beside the point, the cost of one use is the sacrifice of the other.<sup>2</sup>)

From this, however, he proceeded to argue that "equal quantities of labour" (presumably, here, he meant effort-time) at all times and places, may be said to be "of equal value to the labourer, as he must always lay down the same portion of his ease, his liberty and happiness".<sup>3</sup> Here he was saying that "doing nothing" (or complete leisure) always yields the same amount of happiness to all people. That, of course, is the cardinal error: every person knows that "rest" is enjoyed in different degrees at different times by the same individual and, in any case, the satisfaction of one person cannot be compared with that of another. From this error he stumbled into a corollary, that the quantity of labour is a measure of cost and this was the error that his successors, orthodox and unorthodox, seem to have made their cardinal principle.

Armed with the quantity of labour as a measure of cost, it was almost inevitable that Smith and his followers should work on the idea that man pays a price to Nature, measured in labour, for all the things which he acquires. Instead of keeping fast to the basic idea which was correct, that the cost of one allocation is the sacrifice of another, they turned their attention to the consideration of the various prices paid to Nature in terms of labour or effort. They forgot that they were dealing with attractions and counter-attractions of the different possible uses of labour and so were prevented

<sup>1</sup> "Labour is the painful exertion which we undergo to ward off pains of greater amount or to procure pleasures which leave a balance in our favour"—Jevons, W S, *Theory of P E*, pp 181-2. See also Edgeworth, F Y, *Mathematical Psychics: Utilitarian Calculus*, pp 56 et seq.

<sup>2</sup> Wieser's Law. See Robbins, L, "Certain Aspects of the Theory of Costs," *Econ Journ*, 1934. This article gives full references to authorities who developed the concept. See the same author's *Nature and Significance*, p. 69, footnote.

<sup>3</sup> Smith, A, *Wealth of Nations*, bk i, ch v, para 7.

from seeing the process of living as a process of pattern-making ; they led the subject away into those bogs of thought wherein values and efforts have been identified.

"Labour" is but one form of employment to which man allocates his energies, leisure and sleep are others. Leisure, "labour," sleep, may all be useful in various degrees, and in administering his energies and time man makes the best pattern of which he is at the moment capable. Whether he "wills" or not, at any given moment, man's energies are disposed of ; he may be "wasting" them according to some people's ideas, he may be "storing" them ; in all times they are completely assigned to some purpose or purposes. All that he can do is to change their "employment." There is no such thing as "doing nothing"—he is always in some sort of relationship with his environment and, therefore, "enjoying service." If he "works", he sacrifices leisure, if he "idles" he sacrifices the product of work or the product of other "idling".

It follows from this, then, that when a person uses his energy as "labour" in the production of some particular commodity or situation he does not make a decision to use his energy instead of not using it, he decides to use it in one particular way rather than another. If we consider man at work simply as a particular relationship between his body and other resources, we see at once that the allocation of labour is the disposition of man himself. He disposes of himself presumably in such ways that he obtains the maximum satisfaction, or in such a manner as is dictated by the greatest value-in-use of himself. The choice may lie between "leisure" and "work", between leisure occupation and leisure occupation or between work and work. He has to make the choice, and in so doing he learns that he incurs a cost<sup>1</sup>

The notion of real cost has always been associated with the notion of sacrifice,<sup>2</sup> and sacrifice always implies the giving up of something to a particular purpose when it is also wanted in some other relationship. It is the incompatibility of the two desires concerning some particular resource that is the condition which gives rise to real cost, when one of them cannot be satisfied without the other going unsatisfied. This is the meaning of a parent's sacrifice when he gives up his son to a war, he wants him at home and the son is wanted at the war. It is the meaning of a person's *cost* of training for a profession ; he wants to use his time, energy and other resources in other ways, and he wants them used in training. If there were no conflict of wants there could be no sacrifice, no real cost.<sup>3</sup>

<sup>1</sup> Robbins, L., *op. cit.*, p. 29

<sup>2</sup> Marshall, A., *Principles*, p. 339. Real costs equal "Efforts and sacrifices".

<sup>3</sup> "Your economist is a true tragedian."—Robbins, L., *loc. cit.*

Real cost, it will be observed, cannot be identified simply with labour, nor can it be said that it is only the exercise of labour which involves real cost. Real cost is incurred when any resource is allocated in a manner which precludes its allocation in some other desired manner. Put in a general form it is the service which is given up when some other particular service is required.

It will be clear from what has been said that the process of administering resources is a process of giving up satisfactions, utilities, services, values-in-use. This is inevitable. A costless administration is unthinkable. Administration means deciding what to do with certain resources and there is no decision to be made if there are no alternative and incompatible uses to which resources can be put. The making of a decision is the incurring of a cost. The condemnation of man to the earning of his living by the "sweat of his brow" was not the introduction to the world of men of a cost of living. The cost of living appeared when man first was aware of his having to decide how to use resources when he desired to use them in several ways.

In the definition of satisfaction it is implied that a person will always pursue the greater at the expense of the lesser and it follows from this that man allocates his resources so that he acquires an advantage from every act of administration. We cannot, however, infer from this that he necessarily continues to move from one degree of satisfaction to a higher. All that we can say is that he makes the best of his circumstances. Circumstances may be such that the best he attains is a continuously improving best, but, on the other hand, they may be such that it is an increasingly worse best. The climate or other external "natural" conditions may be such that he continually sinks in the scale of satisfaction which he enjoys and the social conditions may be such that the same fate oppresses him.

Each person, pursuing his own equilibrium, making such allocations as he himself adjudges best, may, and frequently does, make such allocations as others find less desirable or even undesirable. He may, and again he frequently does, arrange or administer his resources so that his neighbours are better satisfied. According as he does the one or the other, he imposes upon his neighbours what we may, strictly speaking, regard as costs or confer upon them what we may regard as benefits. In so far as he imposes costs he will establish a resistance to his administration that will involve his own acceptance of costs, in so far as he confers benefits he will not rouse any opposition but may, on the other hand, induce a further benefit to be conferred upon himself by way of inducement or reward.

Thus, in a community of individuals, each of whom is pursuing his own maximum satisfaction, we have the possibility of exchanges of advantages and exchanges of costs, we have also the possibility of some individuals imposing costs on others with no adequate compensation, or conferring benefits on others with the imposition of no costs. To each individual in a group other individuals are means to his own ends. He uses them as he can, by the conferment of benefits, by inducements, or by force. He cannot attain a perfect equilibrium until they are behaving as he wishes them to behave and so there cannot be a perfect equilibrium in society until all the forces that can affect the allocation of all resources are in a state of balance. The pursuit of satisfaction, then, involves not only the administration by each individual of his own "property" but it involves the distribution of property itself.

In a modern community this means that the pursuit of satisfaction is engaged in through State activity. The State is a body primarily concerned with the distribution of property. It is sometimes urged that State "interference" is always, of necessity, an interference with the tendencies of social forces towards equilibrium, but it will be seen from the above argument that it is equally likely that the action of the State in redistributing property may be no more a disequilibrating tendency than its inaction. If the State does not, at times, redistribute property, then the tendencies of men to maximize their own satisfactions will lead them to adopt other methods of redistribution. Certain it is that when the State redistributes property it imposes "costs" on some individuals and confers benefits on others, but no power on earth can say whether the costs or benefits are greater since both are experiences of individuals and one group of individuals bears the costs and another receives the benefits. Neither can it be said that in any individualist system worked solely on exchange principles the total advantage is greater than the total costs incurred, for the same reason. When a bargain is made with a person "in duress" it cannot be said that the advantage of the exploiter balances the disadvantage suffered by the exploited.

We have emphasized throughout this chapter that resources can only be allocated according to their greatest value-in-use by the incurring of costs, that is, by the sacrifice of other values-in-use. The question now arises whether, in the course of time, allocations can be made at different costs. It is sometimes urged that the cost of living becomes progressively easier as time proceeds because labour, through the accumulation of equipment and

knowledge, becomes more and more "efficient" in a physical sense, that is, the physical effects of a given amount of human effort are more considerable.

This conception of a diminishing labour-cost of producing things is a survival of the early idea, which we have already discussed, of labour as the cost of producing things in general. We have shown that labour is not a cost but simply a factor, and that cost can only be interpreted in terms of sacrifice. Factors of production are not, however, "sacrificed"—they are simply used; the sacrifice is of the alternative uses to which they might have been put. If, then, labour becomes more "efficient" it follows that, whenever it is used in one particular way, the "sacrifice" involved is what could have been done with it otherwise, and thus, presumably, is more than could have been done with it before it increased in efficiency.

The increased physical effectiveness of labour is merely a physical phenomenon. It is clear that such changes in labour effectiveness are significant because what men actually do must be limited to what they can do physically. The determination of what they actually do within the limits of physical possibility is not, however, a physical matter; this is a matter of balanced attractions and counter-attractions. An effort made in direction "a" must be withdrawn from direction "b". If in one year the effort in direction "a" is preferable to that in direction "b" it will be devoted to direction "a"; if, in the following year, it produces twice as much physical effect in direction "a" and three times as much in direction "b" we cannot say in which way it will now be devoted because we have no knowledge of the relative desirabilities of the alternative products. Costs cannot be divorced from psychological significance (any more than satisfactions can be so divorced), and changes in physical effectiveness tell us nothing of psychological significances.

This is a matter of considerable interest when we discuss problems of "distribution of wealth". It is sometimes argued that the exchange system has not given to the poor the increase of means that the increased "physical productivity" of labour has made possible. This may be legitimate criticism of the present system, as compared with some other system, but it is not legitimate to expect of an exchange system that it should give these increases simply because increased physical possibility exists; the exchange system is not run on physical principles, it is run on "attractions and counter-attractions" within a given property distribution, and there is no *prima facie* reason why the poor should be relatively

less poor than the rich at one stage of physical productive effectiveness than at another <sup>1</sup>

There is one important point that must be noted in this connection. Changes in knowledge, skill and external conditions have effects on the scheme of attractions and counter-attractions that determine the disposition of physical resources. Not only will these effects be seen in property transactions and methods of using resources within the limits of ordinary property rights, but it is inevitable that they will be seen in the tendencies of men to change the property distribution itself. They will, for instance, most probably show themselves in changes in the amount of free gifts made by the fortunate to the unfortunate, and they will also show themselves in changes in the compulsory transference effected by one means or another. In an ordinary society, such as ours, they will show themselves in State action. To put the position simply, changes in the physical conditions within which men work will lead to new schemes of valuations of the means of living, and amongst those means which are revalued the "electoral franchise" is one. Changes in physical conditions are not alone in causing re-valuations—changes in taste, in conceptions of social order, etc., have similar effects, and they also lead to changes in the value of the franchise and the practice of free giving. The forces which cause men to adopt different technical methods of production also cause them to make changes in the primary allocation of property.

It is impossible to discuss the "flow of value-in-use" or the satisfaction-giving power of material resources over a period of time without reference to the matter of economic progress. The definition of economic progress is a problem that has exercised heavily many economic authorities. Each has his own conception and it is related to what is considered by him to be the point of view of the economist. Some suggest that it should be measured by the quantity of goods possessed or consumed on the average per head of the population or per family per annum: some suggest that it should be regarded as an approach to equality of possessions or goods or services consumed <sup>2</sup>

Taking the view of what constitutes the economic field to be that which is here stated, it follows, logically, that there is only one

<sup>1</sup> Though the "law" of distribution which Pareto formulated in his *Cours d'Economie politique* is not universally accepted—he himself later modified his position—the broad fact still remains that the curve of income distribution is heavily skew, with its bias towards low incomes and, if State assistance and charity were excluded, there would be some whose incomes would be zero, even in our highly productive days.

<sup>2</sup> See Cannan, E., *Review of Econ Theory*, ch. xiv, "Aspirations and Tendencies." Edgeworth, F. Y., *Math Psychics*, pp. 77 et seq. Marshall, A., *Principles*, p. 713.

conception of economic progress possible, namely, that which consists of a nearer approach to an equilibrium of desires with respect to the disposition of resources. What men ought to want is not an economic matter—no ultimate judgment of values can be given by the economist—and it is doubtful if the term "progress" or "ideal" can be used by him at all. When dispositions of resources are unsatisfactory at any point there is a tendency for men to change them; when they are satisfactory there is no tendency to change them. The "ideal" is certainly a condition of equilibrium but whether perfect equilibrium is a desirable ideal or not it is difficult to say<sup>1</sup>. One thing is certain, if, in the scheme of forces which are considered as affecting the disposition of resources, *all* are included, then it can be said that the equilibrium which results from their interaction is the equilibrium towards which the scheme tends in fact. Economists who claim that an equilibrium can be attained in the administration of values-in-use through the simple means of exchange within a given property distribution exclude from the field of active forces a very considerable portion. If the equilibrium contemplated is one in which each individual administers his own properties, *within a scheme of property distribution which has no tendencies to change*, then it may be regarded as an equilibrium which constitutes as near an approach to an ideal as we can hope to attain.

<sup>1</sup> "There is no penumbra of approbation round the Theory of Equilibrium," Robbins, L., *Nature and Significance*, p. 127

## CHAPTER IV

### THE FLOW OF EXCHANGE-VALUE

In a society which employs money, exchange transactions normally take the form of an exchange of rights to use resources against rights to use money. We may visualize the exchange system, then, in a money-using society as one in which there are two flows of property rights amongst the members of the community. These flows are (a) the flow of rights to use real (including personal) resources and securities and (b) the flow of rights to use money. Since by introducing pseudo-resources into the category of things held we have "identified" holding and owning, we can visualize the process as a flow and counterflow of things and money.

There are cases of exchange, of course, in which no money actually passes. Business men frequently keep "contra-accounts", exchanging goods or services direct and using money only as a "measuring rod of value" and not as a medium of exchange. Also, there are cases in which men exchange real resources against each other with no consideration of their money value: these are cases of barter or direct exchange. Barter proper can only exist when there happens to be a "double coincidence of wants", but in the elaborate system of specialization to which we are accustomed one person usually receives money by the sale of services of one kind and pays it out for services of other kinds. Barter is of relatively infrequent occurrence.

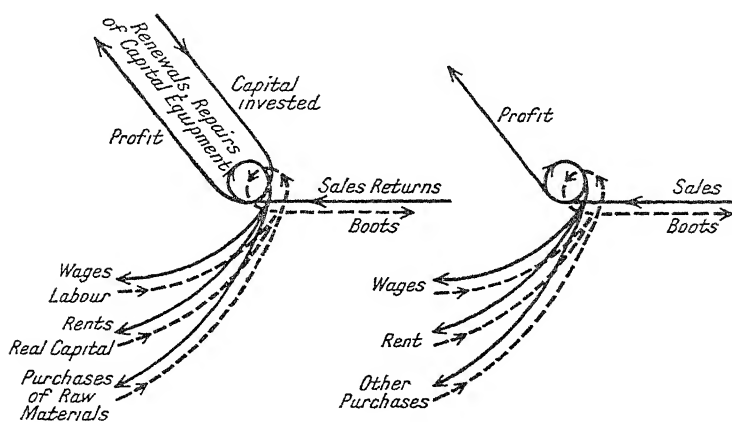
Not so rare, however, are the cases where the right to use money is exchanged against the right to use money, that is, money is sold and bought for money. In these cases the two money amounts exchanged are quantities of purchasing power in different parts of the price structure: a person may give £100 now for £200 to be received twenty years hence, he may give £1,000 now for £50 per annum continuously in the future, or he may buy the money of one country and sell the money of another. Cases of this kind are extremely common, as a glance at the money market immediately shows.

These special cases, however, need not cause us to alter our generalization at this juncture: their significance will be apparent later. It would be more accurate to say that in a monetary economy money's worth is transferred from unit to unit in both directions,



the money's worth sometimes taking the form of money itself and sometimes of things that are worth money, but at the beginning of our discussion it will be easier to think of money flowing in one direction and things in the other.

To obtain a picture of the flow we are here considering it will be best to direct our attention to some particular point in the exchange system and, for this purpose, we cannot do better than consider an ordinary business, a normal going concern. Let us suppose, then, that a company is formed to manufacture boots and let us consider the main features of the procedure of starting and running it. Diagram F will help in the elucidation of the matter.



DIAGRAMS F AND G

In the first place capital will be raised in the form of money subscribed by shareholders. This capital will be at once allocated into two parts, one for the purchase of machinery and other durable things, and the other for the payment of wages, rents, prices of raw materials before the receipts from sales of boots are at hand to pay for them; the former allocation is known as fixed capital and the latter as circulating capital. We will assume, for purposes of argument at this stage, that the buildings and land are rented and no stocks of raw materials or finished goods are held.

When the business is going, the boots are turned out continuously and the proceeds of the sales return for disbursement. If the business is to continue, wages will be advanced for the renewal of labour supplies, rents will be advanced for the renewal of buildings and land services, prices will be paid for the renewal of raw materials.

The rest will be regarded as profit to be divided amongst the shareholders : if there is no remainder, but instead there is a deficiency, this will be regarded as a loss to fall on the shareholders—or to be met out of the proceeds of sales of some of their capital equipment or machinery

In the diagram (Diagram F) the original subscribed capital is represented by the line called " capital invested " shown as running into the business and out again for the purchase of labour disposal, land and buildings disposal, and the disposal of raw materials. The broken lines running in the opposite direction show the inflow of these real resources and their outflow as boots. The " sales returns " line shows the money paid in by customers and it flows away (a) as profit and (b) by the circular route to the purchase of labour, buildings, and other services of real resources. This circular movement at the centre of the diagram indicates that the capital equipment is being continually replaced and, at any moment, a " going concern " has in hand real resources and/or purchasing power representing the capital put in originally to be " turned over ".

Once the business is established and is " going smoothly " it is clear that one of the flows shown in Diagram F is quite unnecessary. We refer, of course, to the " capital invested ". This is the original payment made at the founding of the business, and once the circulation has started all we need consider is the continuous re-investment by the circular movement of money and materials at the centre. We shall return to this line at a later stage, but for our present purposes we may reconstruct the diagram, omitting it. Diagram G is this reconstructed form and it represents an ordinary non-expanding, continuous business unit.

It will be observed that the money which flows into the business from the sale of boots flows out again in two main forms (a) as incomes to those who supply " factors " or services, and (b) as payments to other businesses for their products, which are the raw materials or equipment of this boot factory, e.g. leather, machines, thread, etc. We can imagine a business in which all these flows are constant, a self-repeating system.

If, now, we recall the diagram in the chapter dealing with the physical flow, representing the " synchronization of processes ", we shall be able to construct a diagram that will show the flow of value through a stable organization of many businesses producing at different stages of production. This is Diagram H.

Reading vertically, we see continuous flows of service or production from land, one of the primary resources, from intermediate stages C, B, A, and from " final " stages. Reading horizontally,

we see the series of processes synchronized. Reading obliquely, we see the flow of production through process *and* time. The figures below the symbols represent payments made to other businesses for their products and the figures to the right of the symbols represent payments made as incomes to individuals at those points in the system. Beginning with "land" in Period I we see the services of land for which the landowner currently pays nothing but for which he receives 10 units of money as income of rent or royalty. This amount is carried forward to stage C and, added to the 10 units of money paid out here as income, we have 20 units carried forward as the cost to B in the third period. Here another 10 units is added, having been paid out as incomes, and the payment of 30 is made

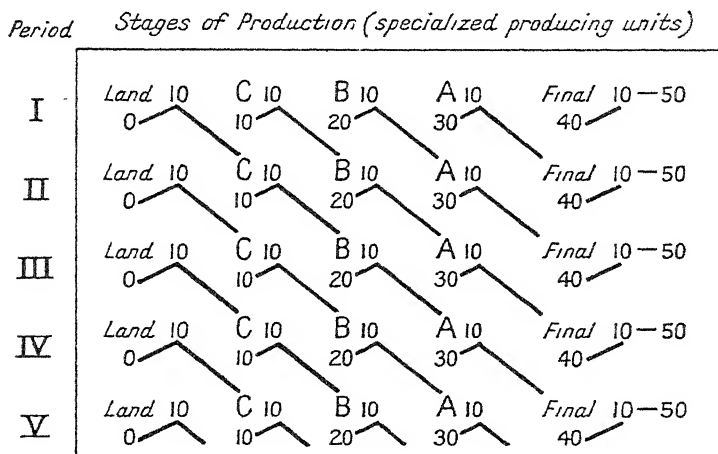


DIAGRAM H

by unit A in the fourth period. A further 10 units is here added and the 40 units are paid by the producers of final goods in the fifth period. the last 10 units is added and selling prices or sales returns of 50 are needed to cover the costs at this stage.

The diagram shows two important features of a continuous system. the money which is paid for consumers of final goods passes, in the course of time, wholly into incomes, and, at every period, the income distributed is equal to the production of final goods, in terms of money. In this case we have a continuous output of 50 units of final goods value and 50 units of income distributed with which the final goods may be bought. The sum of all amounts distributed as income during one period is equal to the sum of all amounts distributed as income down the whole series of processes

through all periods of one stream of production from the point where the original materials are employed. In the diagram, 50 equals both the sum of all figures to the right of the symbols on a horizontal row and the sum of all these figures along a complete oblique line.<sup>1</sup>

A further important observation may be made with the aid of this diagram. We have spoken hitherto as if the equality of incomes and the value of final goods issuing concurrently is due to the incomes being paid for services rendered. It is clear from the diagram, however, that this is not a necessity. The only necessary condition of this equality is that the figures remain constant through time, that is, the figures, read vertically, do not change. If taxes are imposed at any stage for the maintenance of so-called "unproductive" workers or for pensioners the equality remains unaffected. It is true that the product of industry varies, for physical reasons, with the variations in numbers of "workers and parasites", but so long as their proportions remain constant there is no reason why the scheme should not flow on continuously, issuing a product of consumables equal in value to the income distributed concurrently and covering the "costs" incurred in the series of previous processes and the taxes or other "payments" mentioned.<sup>2</sup> This is one way of showing that "an old tax is no tax"; old taxes are payments that become incorporated in the flows here represented.

It is now necessary to look more critically at the classification of payments made by a firm into payments of incomes and payments to other business units at earlier stages of production. We have used this classification to construct Diagram H and we have been able to show very significant figures of an equilibrated exchange system. We have revealed the fact that in a continuous organization, a continuous exchange system as a whole, the value of

<sup>1</sup> This diagram refutes the "A + B Theorem" which is so prominent in the "social credit" literature inspired by Major Douglas. The income payments are "A" payments and payments to other business units are "B" payments. The disparity between 'income distribution' (or purchasing power distribution) and price formation—the disparity between the flows—appears to Major Douglas, it would seem, because his mind runs down one oblique line, representing a single line of production. The "synchronization of processes" which specialization gives provides for a "synchronization of A payments" at all stages, giving a sum equal, in a stationary society, to the value of the consumption goods produced—See Douglas, C. H., *Credit Power and Democracy*, p. 21. See also Robbins, L., "Consumption and the Trade Cycle," *Economica*, Nov., 1932.

<sup>2</sup> See note on Period of Investment, p. 79—one of the "eschelon" diagrams. Substituting money values of the current-resource time units, and assuming these to remain fixed, as they would in a stationary economy, it is clear that we are discussing the same matter. The total value of these "payments" for current resources through a complete period of production equals the amount paid out at one time in a synchronized system of processes.

consumption goods at any moment or over a period is equal to the personal income distributed.

The consumable services are not, however, the total production of the system at any moment. This production (in terms of value) is the total of consumable or final services, raw materials, and intermediate resources. If we make up this total for any given period in the diagram we find that it is 150 units. The "land" is worth 10, C is worth 20, B is worth 30, A 40, and the final goods 50, and all of this production must be paid for currently.

The total income which meets this expenditure is seen in the diagram if we follow the oblique lines upwards, following the flow of money. To keep the scheme continually moving, 50 units must be paid to the producers of final goods, 40 to the producers at A stage, 30 to those at B, 20 to those at C, and 10 to the suppliers of raw materials. These payments must be made concurrently.

During a single period of production the following payments are made in money.—

(a) 50 units are paid by those who receive "personal" incomes: 10 to landlords, and 10 at each of the succeeding stages concurrently,

(b) "Final" goods producers pay 40 to A, A producers pay 30 to B, B pay 20 to C, and C pay 10 to the landlord.

These payments are effected as the following transferences of resources are effected in the opposite directions:—

(a) 50 units of final goods (in value) are transferred to "personal" income recipients at all stages;

(b) "A" producers transfer their products to final producers, "B" producers transfer theirs to "A"; "C" transfer theirs to "B", and landlords theirs, the original land resources, to "C".

Thus the diagram shows a continuous production and a continuous purchase, a continuous flow and counterflow, and, once the money is in circulation, the same quantity of money flows round and round, bringing the "services" into existence and carrying them on to their point of extinction—perhaps it would be better to say, keeping in motion the circulation of all the real resources, through "consumers" as well as through "producers".

A further examination of this diagram will show that there are two ways of regarding the total income of an exchange economy as here depicted. We may, in the first place, regard it as the current production of consumables (or final goods) or as the money received as personal incomes. In the second place, we may regard

it as the current production of all goods (consumables and intermediate), or, broadly, as the money received as personal *and* business incomes<sup>1</sup> We may, taking the figures of the diagram as illustration, reckon the income of 50 units of value per period or 150 units per period; in the former case we think only of consumables and in the latter we think of consumables and all products destined later to become consumables<sup>2</sup>

Diagram I represents the same situation as Diagram H, but being drawn on the circular principle, it shows the continuity, the continuous round of a "self-repeating" scheme. The full lines show the flow of goods and services and the broken lines the flow of money. No money is shown as entering the raw materials circle as payment, for these are made into the "personal" circle (P) which represents all persons who receive incomes.

This "circulating" representation of the flows of money and services suggests an alternative way of regarding the exchange economy to that which is normally employed. It is usual to think of the economic system as concerned with the production, distribution, and consumption of "goods and services", the diagram shows that it may well be interpreted as concerned with the production, distribution and consumption of money; and for some points of exposition, this mode of regarding it is the more convenient<sup>3</sup>

<sup>1</sup> In a certain sense we may say that there is a degree of arbitrariness in dividing incomes into business incomes and personal incomes, in the same way as there is a degree of arbitrariness in dividing a person's "living time" into leisure and working time. We have seen the necessity for rejecting the latter in economic theory, and if we do not reject the former we should be aware of the arbitrariness. If a man owns two kinds of "stock" (in Smith's sense) and he devotes one part to his "business" and one part to his "domestic establishment" we cannot infer that from the former he merely derives "means of living" which he transfers to the other. He possesses *one stock*, and though the maintenance of his business is necessary to maintain his home, the maintenance of his home is necessary to the maintenance of his business. We cannot say he derives money income from one and satisfactions from the other—for his "standard of living" depends on the resources he administers in his business! There are advantages in speaking of "final" goods and other orders of goods, but it is arbitrary to say that a business man does not derive joy from the whirring of his machines, etc.

Accepting the distinction between final goods and others it would seem, then, logically necessary to consider a person's income as the purchase of final goods to be consumed immediately. In terms of goods, personal income would be the goods *finally consumed* at the time of consumption. This would be in accord with Professor Irving Fisher's suggestion that income consists of those services of men and things which enter into consumption directly. (See Fisher, I., *Nature of Capital and Income*)

<sup>2</sup> For various conceptions of "national income", see Marshall, A., *Principles*, p. 524. Pigou, A. C., *Econ. of Welfare*, ch. iii. Smith, A., *Wealth of Nations*, intro. See also Robbins, L., *Nature and Significance*, pp. 63-8.

<sup>3</sup> When money-flow is considered there is no difficulty in making a sum of various flows as there is when the "national income" is regarded as "goods and services", a mass of incommensurables.

It is now proposed to present another series of diagrams intended to display the flows of money and money's worth more completely than those which we have already presented. They will, it is hoped, give a view of the structure of the exchange system, show the flows of incomes and other payments and, in addition, show the point of inflow of new money.

As in Diagram H we shall, in constructing these diagrams, make

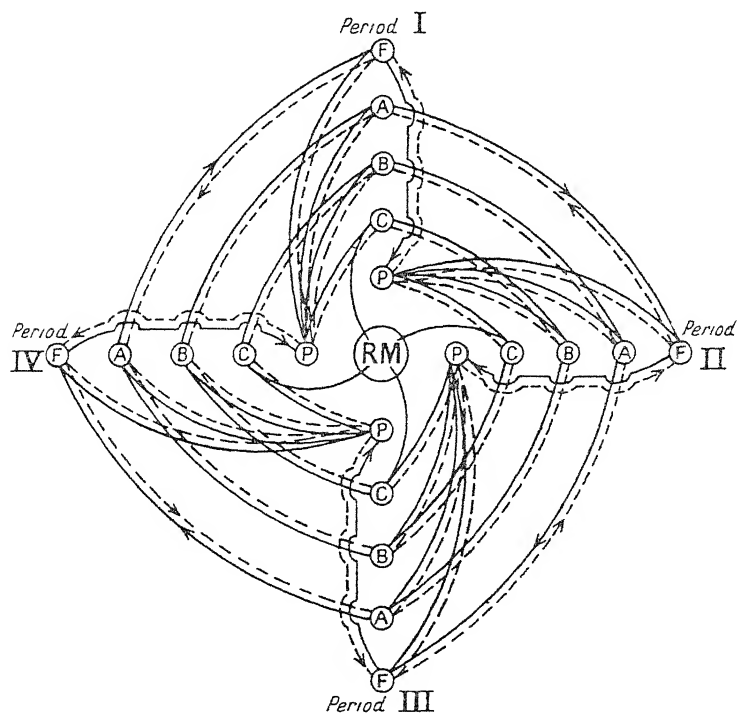


DIAGRAM I

their basic feature the representation of the "roundabout" structure of production. That is, we shall show that the economic system is, physically, one in which human energy and other resources are employed in the production of final or "consumption" goods *via* a series of intermediate stages. Some of these diagrams have been extensively employed in recent years<sup>1</sup>

Diagram J is shown in three forms: (1) and (2) are parts of

<sup>1</sup> See Hayek, F. A. von, *Prices and Production*, Lecture II.

(3). In Diagram J (1) the flow of real resources is shown from the primary or "original", or currently available state (O) through the intermediate stages (I) to the final goods ready for consumption (F). Four units of original resources are represented by four squares at the top of the diagram. One unit of these is moved to the first intermediate stage and then, joined by another unit of original resources, it moves up to the second stage, the process being repeated until finally we have them emerging as four units of consumption goods. These are then carried to the

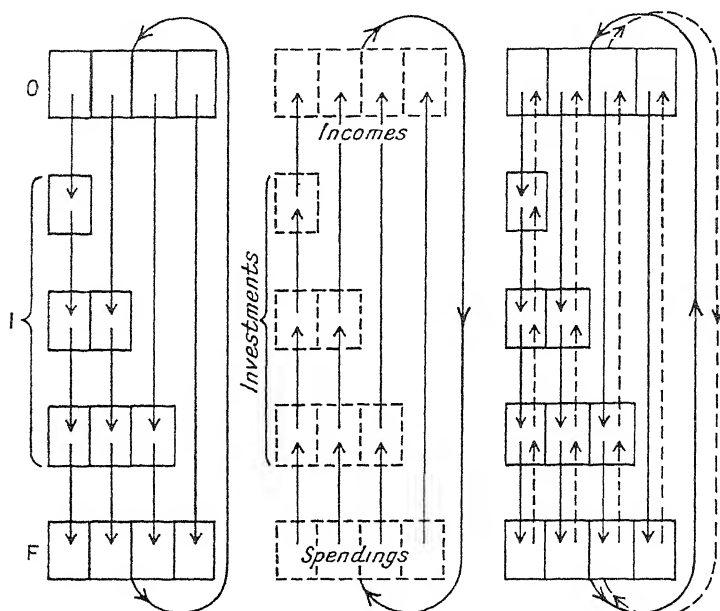


DIAGRAM J

top of the diagram to show that they are consumed by the owners of the original resources. The intention of this diagram is to show that the intermediate and final goods are in the nature of "accumulations" of original resources and, further, to show that time is a necessary dimension of the roundabout method of production.

Diagram J (2) shows the flow of money in the opposite direction. If it is to show the scheme operated smoothly by the employment of money then we must represent a quantity of money equal to the money value of the consumption goods at the bottom of the diagram: we show, therefore, four units of money. At the first



stage, after being spent on the consumption goods, this money is shown as passing, one unit to the owners of original resources (as income), and the other as payments for the intermediate goods employed. That which is paid for intermediate goods flows on similarly, being spent partly as income and partly on intermediate goods until finally it is all paid out as income, the curved line showing this income carried round for expenditure on consumable goods.

Diagram J (3) represents the double flow, that of money superimposed on that of the real resources, the former being shown by broken lines and the latter by the full lines. It shows that the money paid for consumers' goods ultimately finds its way to the suppliers of the original resources as incomes and it also shows that a certain quantity of money is at any moment within the system carrying forward intermediate goods from stage to stage. Alternatively it may be said that the diagram shows the issue of consumers' goods in return for the income expended and, within the system, it shows the goods carrying this money forward (or backward) in the intermediate stages. There is one weakness in this diagram, however, which is the suggestion that there are only two kinds of income, wages and the payments for original external resources, or, as they are usually regarded, payments for the use of land and extractions from it, whereas, in fact, incomes are also collected by those who own intermediate goods.

This difficulty can be overcome if we produce a diagram in which money itself is introduced as an original resource.<sup>1</sup> For many years money was treated by economists merely as a means of exchange and money was regarded as something whose quantity simply affected the price level. As we showed, however, in our chapter on property, a conception of the distribution of property which excludes the distribution of money is an imperfect conception for, since an exchange system is a system of property exchange, money must be brought into the picture as a resource. Diagram K is intended to meet this requirement.

The lower large rectangle represents the whole body of producer-consumers, those who supply resources in return for income with which they buy the products of their resources, consumers' goods. The upper large rectangle represents the whole of "industry and trade", the exchange system from which those in the lower group receive their means of living and to whom they render their services. None can draw an income in this diagrammatic society without rendering some sort of service.

<sup>1</sup> See Schumpeter, J., *Theory of Economic Development*, where he makes the first business of an entrepreneur starting a new enterprise the collection of *purchasing power*.

The smaller squares in the lower rectangle represent the possessions of producer-customers: Labour, raw materials (land and things contained therein and any other original resources), and money are the three primary resources. Consumers goods are the products bought and securities are documentary titles to receive incomes on account of money lent. The smaller squares in the upper rectangle represent the stages of production I, II, III, and they are divided

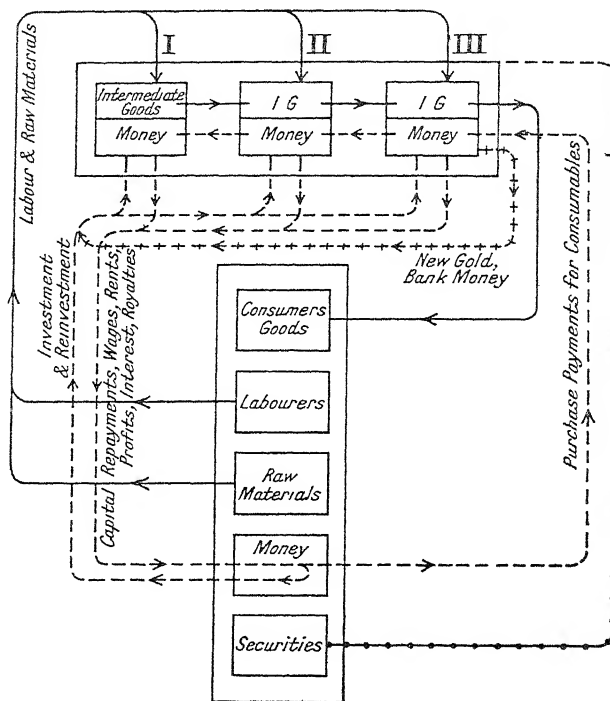


DIAGRAM K

into two parts, each to show that the businesses at each stage hold intermediate goods and/or money.

The full lines flowing from labour and raw or original materials show these things carried from their owners into the business world and carried to any of the three stages here depicted. The broken line issuing from the left of the producer-customers' money square shows the flow of investment money. This is the money that lies in the business world or is flowing through it. Like the other original

or primary resources it may be put into the system at any stage of production

The broken lines flowing out of the "stages of production" squares represent (a) the repayment of money invested and (b) the "income payments" made in return for the original resources as wages, royalties, interest, dividends, profits, etc. In a continuous, unchanging system the repayments of capital are returned as reinvestments along the investment line, though this process is usually short-circuited and the directors of business units reinvest the money as it comes from consumers or the subsequent stages of production. In all company organizations the governing authority of the company does this without reference to the owners of the money or money's worth, though in many one-man businesses the money is easily turned from reinvestment into other investments or personal spending.

The outflow of money to the right from the consumer-producers' money square is the flow of payments for the purchase of consumers' goods which are shown as flowing along a full line emerging from the right of the upper large rectangle. The chain line indicates the fact that all the business structure belongs to those who hold securities and is placed here to make a symmetrical design; it shows the flow of documentary or other evidence of rights corresponding to the flow of investments

Within the upper large rectangle are seen the flows of money and intermediate goods in opposite directions. These quantities of resources, real and pseudo, are the "savings" which have been "invested" in business. If there were no "roundabout" method of production, no "time" production, but, instead, all producers rendered direct final services to one another, there would be no need for these accumulations.

The broken line, flecked with crosses and issuing from the right of the upper large rectangle beside the flow of consumers' goods, is inserted to represent the issue of new money from gold mines, banks (in the form of bank money) and any "hoards", and it is shown as flowing into the stream of investments. This may be a disturbing element in a changing system.<sup>1</sup> In a perfectly equilibrated system there would here be no flow except that which was necessary to replace worn-out gold (or other metal) money, or to replace old credits expiring with new ones to the same amount.

This diagram shows all that Diagram J shows and more besides. On the side of real resources it shows the raw or original materials and labour flowing into the business world at different points. Further,

<sup>1</sup> See p. 159 above. The nature of this disturbing feature is discussed below p. 121, also p. 308.

it shows that those which enter at stage I are worked into things that can pass on to stage II and so on, through whatever number of stages there may be, to the final or consumption stage, to be passed on for consumption by those who have received the incomes to spend upon them.

The maintenance of the intermediate goods flow is a form of "real saving"; it can only be effected if someone is willing to take labour and raw materials into storage, so to speak. Those who perform this function do so only if there is a payment as compensation, to store for no advantage is to be futile. "Real saving" in this way is better described as "real investment", for it involves the conversion of money into things of final value in the future. In a continuous system there must be continuous "real saving" or "real investment", and a reward in terms of consumables must be made for this service.

If now we follow through the flow of money we see the reflection of what we have said of the flow of real resources or rights to use real resources. Money leaves the consumer-producer as the purchase payments for consumable goods. It enters the business world at stage III in this diagram and then divides into two parts; one part is passed on to stage II in return for intermediate products bought therefrom and the other part turns down in the diagram and goes as incomes. Repayment of capital and reinvestment which takes place immediately may be omitted. That which goes to stage II is treated similarly and that which reaches stage I passes out wholly for the purchase of original materials and labour and as "interest" on money invested. Thus all the money which goes in spendings on consumables ultimately reaches, in a smoothly flowing continuous system, the consumer-producers as income in the form of wages, rents, interest, royalties, profits, etc. It follows from this that if the flow of consumables is to be maintained evenly and continuously the flow of "spendings" must be maintained and the flow of "savings" also, and if the flows of spendings and savings are to be maintained the flow of income must be maintained.

In the hands of the units controlling the various stages of production there are, at all times, stocks of money. These stocks are not usually regarded as "intermediate" goods, and yet it is obvious from this diagram that they should be so regarded. They are "locked up" in the production system and are there only as a result of saving on the part of somebody. The intermediate goods are "real investment" representing money disbursed as income for services which are accumulated; the money stocks are investments of savings by producer-consumers or, on their behalf, by the business units themselves, and, obviously, they are there only because they

are expected to earn an income. At any given moment the total amount of money's worth in the production system is greater than the value of the intermediate real goods themselves: it includes money stocks also.

There are certain features of our economic system revealed by this diagram which were either not revealed at all or only faintly revealed in our earlier Diagram J. The most prominent of these is the relationship between the squares and the lines of flow.

The basic feature of the diagram is the double flow of money and real resources and services in opposite directions. The original real resources flow out from the possession of the consumer-producers into the "production system", they flow through the various stages of production, emerging as consumers' goods to enter the consumer-producers' system. In the opposite direction flows the money spent on these consumables. It enters the production system, flows through and emerges, at the first stage or *en route*, as incomes to the producer-consumer group. The continuity of the system implies the continuity of this double flow.

If now we focus attention on the producer-consumer group, the production or business system as a whole or the stages of production, that is, focus the attention on the squares representing these units, we see that each unit or group renders service and receives payment. The ratios between these flows are known as "service prices". We are, of course, in ordinary life, familiar with this conception of service price in the case of rent, wages, interest, and it is clear that all of these payments may be regarded as falling into one category and spoken of as "rents" of various kinds. It is, not, however, so generally appreciated that the sales-returns of a business are, strictly speaking, service rents of that business.

This is a most important conception which we shall employ later in this chapter. The reason for its not being clearly apprehended is a very simple one. When a house is rented or a labourer is hired, the payments of rent and wages are considered as payments for service streams. When the house is bought it is rarely considered as the embodiment of a stream of housebuilding service. We *buy* the house but we *hire* the builder's business in so doing; we *hire* a house but we *buy* the service of the house. The business world in general, then, *buys* the services of the consumer-producer group (the working population and owners of land) and sells its services to them; or, the business world *hires* the producer-consumers' resources or rights and the producer-consumers *hire* the business world.

The second feature of the system which this diagram reveals is that each unit may be regarded as possessing a "reservoir" or

" box " or " till ", through which these service and money streams flow. Changes in the relative magnitudes of inflow and outflow may, therefore, cause changes in the contents of these " stores " containers. Increases in " stocks " are savings or hoardings; decreases are dishoardings. Thus, consumers' goods, producers' goods and money may be hoarded and one may even regard, under some conditions, a worker " conserving his strength " as hoarding labour.

Hoarding and saving or storing are, strictly speaking, the same thing and the employment of hoards or savings is investment. We now see the significance of the two money flows which are not in the circulatory scheme which we noted as the basic feature of our diagram. The stream marked " investments and re-investments " is seen to be a " turning back of the stream of income ", a transference to business of accumulated income. True, it passes into the business world and, as money, is dishoarded or turned back into the stream again, but it is replaced to some extent by " hoards " of intermediate goods. The line indicating " new gold and bank money " is seen to be the equivalent of hoarding; it may be kept " in store " (reserve lending capacity of the banking system) or it may be put into use by being invested.

The third important feature of the exchange system may be described if attention is directed to the " securities square " in the consumer-producers' rectangle. This feature is not, perhaps, obvious in the diagram, but the diagram helps in revealing it.

Those who hold securities issued by business organizations are they who have either invested money or money's worth therein or have bought them (or received them as gifts) from those who have invested. Security holders have the right to draw the net income of the business organization when the expenses of maintenance in the form of wages, rents, and purchases of replacements, etc., have been made. Recalling what we said above, that the " sales returns " of a business unit may be regarded as the " rent " of the business paid by the market, we may regard the " net income " disbursed to the holders of securities as a "*net rent* ".<sup>1</sup> The diagram then suggests that, ultimately, incomes fall into three categories: wages paid to labourers, rents (and royalties) to owners of original resources, and the " net rents " of business paid to holders of securities, that is, to those who have, or represent those who have,

<sup>1</sup> It should be noted that in a stationary economy there cannot be any " net " income in the nature of a surplus of income over expenditure—that is, no " windfalls ". By assumption, the pattern of living is to be maintained, so it follows that the whole income is allocated in advance. The concept of " net income " must, then, be defined in a stationary economy as that part which is *spent on final goods*.

invested money in the business and are, consequently, owners of the intermediate resources frequently termed "capital"

This really was the income classification employed by Adam Smith and the early Classical writers, the only differences being that what we have called "net rents" of business or returns on securities or capital resources, they called profits on capital, and original real resources they regarded as land. To these writers there were three factors of production, the land or natural resources, labour and capital, the last of these being man-made material equipment.

Now, immediately we begin to consider the significance of this classification as a device for understanding the distribution of income, we realize that it is, in reality, rather primitive: the incomes so considered are either too simple or too complex

In the first place, if capital is to be regarded as man-made resources—the product of labour and land as original factors—it is clear that a really scientific classification will require that what we called "intermediate labour" in our chapter on physical resources will also have to be included as capital. When a worker spends energy and other resources to acquire professional knowledge or artisan's skill he invests his resources in "personal capital"<sup>1</sup> just as truly as a person invests his resources in the making of a machine and if the return on capital in this latter case is to be regarded as profit it is logical to say that a worker's wage in the former case is profit also. The simple distinction between wages of labour and profit on capital is thus not valid or, at least, it is not so simple as it appeared to be.

In the second place, when it is realized that capital in the sense of man-made material equipment is never anything more or less than improved land, the separate identification of the rent of land in its natural unimproved form, and the profits on the improvements in the land, effected by the person's employment of labour and other resources thereon, becomes difficult to conceive and impossible to calculate. There is very little land in a country like England, for instance, which has not been improved to its present condition, and the question arises as to how much of the "rent", in the ordinary sense of the term, is really rent of "original" land and how much is profit on improvements. It has been argued with good show of proof that, if the returns on improvements should be regarded as profits, then, in most cases, the actual rents of land in the ordinary commercial sense should be regarded wholly as profit, and in many cases, a very poor profit on that which has been invested in it.<sup>2</sup>

<sup>1</sup> Marshall, A., *Principles*, pp 216–19.

<sup>2</sup> Bedford, Duke of, *The Story of a Great Estate*.

Economists have recognized these difficulties and have presented an apparently logical scheme which claims to overcome them. Thus they have argued that the stream of income in the exchange system is divided into three parts, one passing into labour, another to land, and the third to improvements effected on labour and land and to the man-made material equipment, such as machinery and buildings, regarded ordinarily as typical capital equipment. This apparently logical scheme is, however, being more and more widely rejected as it seems to be based on an entirely wrong view of the whole situation.

The fundamental weakness of this analysis was destined to be revealed when economists, presenting it, slipped into the habit of speaking of incomes as the reward of saving (and later, risk bearing), while rent was put in a class apart as a toll or levy or an unearned (sometimes undeserved) income. It is true, of course, that a person must always compensate another for the loss of anything he wishes to acquire from him but careful examination of the situation reveals the fact that the so-called "reward" has to be paid because the resource to be sold is regarded as holding out a *prospective* advantage to its holder. If I buy a commodity I do not consider what the commodity has cost the seller to produce or acquire it. If I am selling a thing I do not expect to obtain what it has cost me in the past, I expect to receive what the buyer thinks it will be worth to him. If I expect anything else I expect my buyer or seller not to act according to the principle of economy and this is irrational. The values of things are not determined by their origins, virtuous or otherwise: they are determined by their expected yields of satisfaction.

This being the general position, it is clear that the values of labour, skilled and unskilled, land, unimproved and improved, man-made material equipment or nature's gifts which any person owns, are all determined in exactly the same way. The incomes derived from all of them are of the same nature and must be regarded as "rents", wages are the "rents" of labourers, profits and interest are the "rents" of land or any other material equipment or money. If we are to place these incomes in more than one category we can only place them in two, incomes from labour and incomes from real resources and money, or, in other words, wages and rents.

There was another circumstance which led economists to classify incomes in the threefold way which we have indicated: this was their defined objective of study. Generally, they were, in the early days of the science, interested in showing how to attain a condition of maximum wealth in the community as a whole or the maximum



average income per head. Later, their successors, in some cases, tended to define their objective as the discovery of the conditions leading to equilibrium. Now, immediately a desired objective is stated, immediately the science becomes normative, it is inevitable that its exponents will assert the necessity of rewards for efforts and sacrifices as conditions of the attainment of the objective. But it should be observed that because, in equilibrium, efforts must be rewarded it does not follow that, in the actual economic systems which the science examines, the prices which are paid for efforts are such as will establish equilibrium. In equilibrium, if a person has spent ten shillings in the production of a commodity, he will receive at least ten shillings in its price : in the actual system he may or he may not. As we said above, the system is not a reward distribution agency, it is a system in which men seek their best advantage and this means that all eyes are turned to the future, to expectations, past events are of no account, except as providing data for making estimates of future behaviour of men and things. The truth of this assertion can be demonstrated by reference to the valuation of securities and land.

The value of a business security is the amount of money which the market is willing to pay in a lump sum in return for the right to draw the "net rent" (or a share of it) from the business<sup>1</sup>. What has been given for the security has nothing to do with the case at all : that the security originated in some one's investment in business is entirely irrelevant. The only relevant figures are those of expected revenues of business—the favours to come.

If we consider the value of a piece of land we find the position precisely similar. The value of a piece of land is the present worth, in a lump sum, of the net revenue which the land is expected to yield. That the land is a gift of Nature, raw, uncultivated, unimproved, or, on the other hand, cultivated and improved, is entirely irrelevant. All that matters is the expectation of a net income from its ownership.

Securities and land being valued in the same way, it follows that the incomes which they represent are similar in this respect, that they are the basic figures which are considered in capital valuation, the capital value being derived from them. The income

<sup>1</sup> Professor Schumpeter (*The Theory of Economic Development*, pp 115–127). This essay contains one of the most brilliant studies extant of a perfectly stationary economy. The reader's attention is particularly drawn here to his treatment of capital values and his assertion that there is no independent capital market in such an economy, though there is such a market "in a theoretical sense". These values lie dormant, so to speak, in a perfectly equilibrated system and they are only roused to active exchange in a dynamic system.

received from land or securities is not determined by what has been paid for them, what is paid for them is derived from the expected figures. Once this point is grasped its universal applicability is also appreciated. The value of anything is the present worth, in a lump sum, of the net income value that is to be expected from it. Whether it be the share in a business, the value of a house, a machine, a hat or a loaf of bread, it matters not. This is the relationship of capital value and income or service value, of which more will be said later.

We may now return to the relationship of investment and "net rent or profit" of business. We have stated that the profit of a business is not determined by what has been put in the business but that the value of a business's securities is determined by the profit to be expected. Is there any relationship between that which is invested and the "net revenue"? The answer is in the affirmative, but the relationship of importance is not that between what has been invested and the profit but between *what is being currently invested in business* and *the profit expected from this current investment*<sup>1</sup>

The diagram shows that the continuance of the system involves a continuous reinvestment of money in the business organization. Similarly, an expansion of the system involves new investment. This reinvestment or new investment does not take place unless the anticipated yield to it is satisfactory. The yield that must be satisfactory is the yield to the new investment or reinvestment. Making an investment in the production scheme (a *real* investment as it is sometimes called) is determined by the same kind of consideration that determines the value of a security already in existence. An investment of money is made in the production system up to but not exceeding the present value of the expected net income which this investment makes possible to acquire, and the price of the security is the value of the net income to which it constitutes a claim.

The Classical writers who emphasized the distinction between land rents, wages, and profits, by giving attention to their origin in the economic structure, were led to make their distinction hang on the supposed facts that capital earned profit, labour earned wages, but landlords picked up a rent that "appeared" in the price system. When we turn our faces forward instead of backward we realize that all incomes "appear" in the price system and the landlord

<sup>1</sup> This relationship holds even in a stationary economy. In a dynamic economy it is of prime importance, being responsible for the variations in size of a business through time. In a stationary economy reinvestment must take place, by assumption, in a dynamic economy it *may*, in the latter case it *will*, if there is no better alternative

holds on to this income or sells it to an investor in land, the wage earner puts his work where wages will emerge, and a business speculator, in the production of goods or services for sale, merely does what the land investor and workers do, he takes steps to acquire the income that lies there for the purchasing or acquiring. The income derived from money-capital is the rent of the capital.

The conclusion to which we are, therefore, impelled, is that there is no room in a classification of income for a special category to be called interest. Interest is to be regarded simply as a ratio between capital value and service value and service value is rent—of labourers or other resources. (It will be remembered that in our chapter dealing with the "Distribution of Money Value" we referred to the resources of a person's name and legal monopoly rights such as patent rights and copyrights. Though these "resources" are intangible, being rights to make certain patterns or to allow others to do so, they must be regarded here along with the tangible resources of labourers, material things, and money. If we regard the documents—or legal statements—as tangible, then we can speak of these rights as pseudo-resources, whose values are derived from their "rent" earning capacity. They do not affect the analysis of income at all.)

This brings us to the fourth point regarding the economic system which this diagram helps us to understand. If we consider the flow of money into the hands of producer-consumers we discover that there are four ways in which it may be disposed of. It may be employed—

- (a) in the purchase of consumables for immediate use ;
- (b) for re-investment or new investment in real resources (consumables, or production goods) ;
- (c) in the purchase of securities or other capital assets<sup>1</sup> already existing (including monopoly rights, etc) ;
- (d) in hoardings.

That which is employed in the purchase of consumables for immediate use is said to be *spent*, while that which is disposed of in other ways is *saved*. That which is disposed of by methods (b) and (c) is *invested* and the remainder of the savings is *hoarded*. Method (b) differs from method (c) in that the former is a new real investment or "capital building" and the latter is investment transference or capital purchase. In both forms of investment,

<sup>1</sup> This use of money exists in a *dynamic* economy. In the following pages we move into a consideration of this, the actual economy.

however—capital building or capital purchase—rights to future streams of *net income* or net rent are acquired.

It will be convenient at this juncture if we summarize the position at which we have arrived, by setting out the price payments that are made in the economic system and showing their relationships to one another

In the first place we have shown that prices fall into two categories, service prices and capital prices. Service prices are payments made for the hire of resources and must, therefore, be regarded as hire payments per unit of resource per unit of time. This category includes wages paid for the hire of men, rents for the hire of land, buildings, machines, and all durable things, sales returns of businesses. We have shown that these prices must be regarded as gross rents or gross hire payments.

Capital prices are present prices paid for future streams of services<sup>1</sup> and, therefore, if the resources above mentioned are to be regarded as having capital values it is necessary that from the anticipated gross rents must be deducted the anticipated expenses that must be incurred in order that rents may be received. Thus, capital prices are prices paid for future "net rents". The capital value of a slave is the present value of the anticipated earnings of the slave minus the anticipated expenses of maintaining him. The capital value of a unit of land or a building, a machine, or a business is the present worth of the anticipated gross rent less the anticipated expenditure incurred in maintaining the stream of rent. If no expenditure is anticipated then, of course, the gross rent and net rent are equal: such a case is found when a person wears a thing out without repairing it.

In the second place we have shown that all "net" incomes are "net rents". Men draw their incomes from the lending or hiring of their property and their property includes themselves (their manual labour, knowledge, skill, judgment, reputation, etc.). Theoretically there is no reason for such distinctions as wages, rents, profits, dividends, interest, etc.; they are all net service prices rendered by resources or groups of resources.

In Diagram L an attempt is made to show, in a simplified but fairly complete manner, the flows of exchange value which we have discussed in this chapter. The lowest rectangle represents the body of producer-consumers (the domestic units of the community); the highest rectangle represents the business organizations (with two groups to suggest the "roundabout" organization); the middle rectangle shows the banking organization put in a place of its own because of its peculiar functions of storing and supplying money.

<sup>1</sup> See Marshall, A., *Principles*, p. 445

The lines between the rectangles represent flows of money (broken lines) and flows of money's worth in the form of services and resources, real and pseudo. For the sake of simplification we assume that businesses do not invest in each other's stock but buy and sell products only: we also show businesses as not possessing labour resources since, though they can purchase labour in advance by contract, the labourer is his own property

If we consider *flows of money* first (excluding banks for the time being), it will be seen that it passes round in a circulatory manner, through business and domestic organizations. Passing along from domestic units, it is seen divided into two streams, *capital* and *service payments*: the capital payment flow breaks into two, also, the one being investment, reinvestment, and loans, the other the "capital" purchases of consumables (future consumable services).<sup>1</sup> The service payments are for direct consumable services, perishable goods whose capital and service prices are identical, and hirings of durable consumables such as houses.

Passing from the business organization to domestic units, there are, again, two streams of money: capital and service payments. The capital payments are (1) repayments of investments and loans, and (2) purchase payments for future services, while the service payments are wages and rents, the latter including rents, as ordinarily understood, of all kinds of resources, and "business rents" or profits (dividends, interest, etc.).

Running counter to these flows of money are the *flows of resources and services* that are bought. From the business organization to the domestic the flow breaks into two: (a) securities and durable consumable goods, and (b) consumers' services and perishable consumable goods. On the other side of the diagram are the resources and service flows corresponding to the money payments alongside. Capital goods, such as land, etc., and securities cancelled represent the capital transfers; and labour services, along with the services of non-human resources, represent the service transfers.<sup>2</sup>

At the corners of the rectangles are small arrows indicating wastes, appreciation, and depreciation. These are necessary if the

<sup>1</sup> Final goods bought for stock are payments for future services and their prices are, therefore, "capital prices".

<sup>2</sup> We are here making the assumption that labour is paid for currently with its service. In fact, labour is usually sold ahead in periods (by contract) and so, strictly speaking, wages are "capital prices", and employers, on the average, when they pay in arrears, as is usual, hold a quantity of labour as "capital". If we assume all workers to be weekly wage-earners, receiving their wages in arrear, employers work with capital borrowed from workers to the extent of one-half of the weekly wage bill measured in money.

diagram is to be capable of use in explaining a dynamic organization. The "waste" lines represent the outflow of physical resources—wear and tear, decay, etc—which is not an outflow to other units. That which is wasted is paid for, and, consequently, that which goes forward must be paid for at a rate that will cover its purchase if the scheme is in continuous equilibrium.

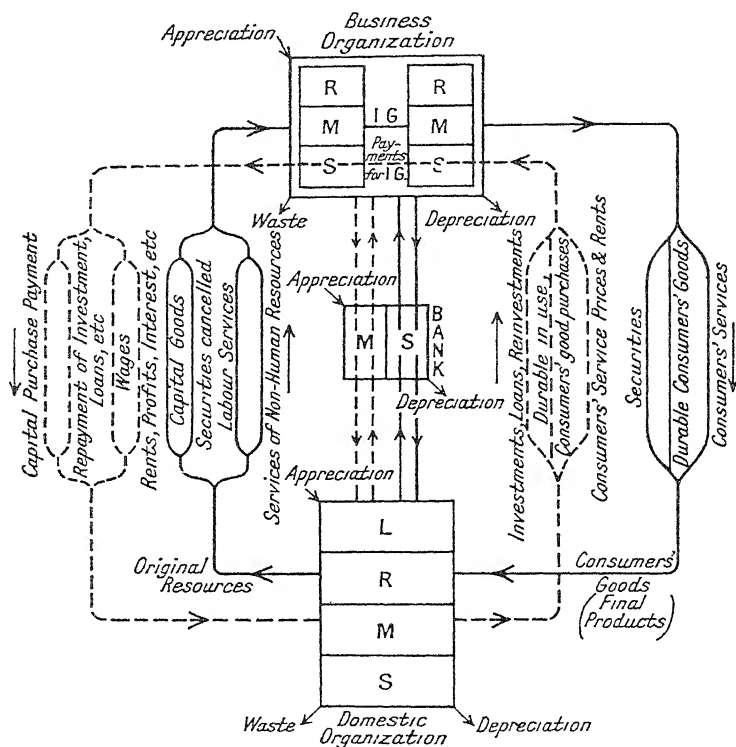


DIAGRAM L

The arrows indicating appreciation and depreciation, inflow and outflow of value, are shown in this way because they represent flows of money value which are not transfers from unit to unit, but are the changes in capital value due to physical accumulation or decumulation, changes in knowledge, changes in the price scheme or other dynamic forces which cause variations in capital value, discussed in a later part of this chapter.

The banking organization is shown as possessing only two kinds

of resources—both pseudo-resources—money and securities. These alone are shown since they are the most significant resources employed by the banks in the exchange economy. In so far as they use other resources they are like other business units and call for no special comment. The lines shown between the banks and other units indicate the flows of money and securities in and out of the banks.

Within each organization the rectangles representing the various resources held are the reservoirs of resources to which we referred above. If inflows exceed outflows—of material resources, pseudo-resources or money—then these reservoirs fill up and we have indicated the building up of capital resources (production and consumption), hoards of money, or accumulations of securities. When outflows exceed inflows, there are depletions of these resources. The effects of varying waste and changes due to appreciation and depreciation are, therefore, to be seen in these reservoirs.

Diagram L enables us to exhibit two other phenomena in the economic system. It shows resources transferred from owners to the business world as capital (money, land, etc.), and, on the opposite side it shows securities returned by business to owners. Thus, the investment of capital is indicated, as it were, in two ways—the movement of the actual resources invested and the securities which represent the right to draw the “rents”. These rents are shown as income flows.

If there are two representations of an investment in the diagram (corresponding to actual fact), then there are two ratios which may be expressed between the *income derived* (or “rent”) and the *investment*. There is the ratio of income to the value actually invested and there is the ratio of income to the value of the security. In a stationary economy they are, of course, identical. In a changing economy they frequently are not. It is necessary, therefore, to distinguish the one from the other. The former is the *rate of profit*, declared by business firms, as a rule, the latter is the *rate of yield* on the amount that has to be paid for the security at any moment in the market.<sup>1</sup>

Hitherto in this chapter we have considered the economic system as a going concern, but we have described it as uniformly going; that is, we have considered a stationary system, a repeating or

<sup>1</sup> If the *rate of profit* and *rate of yield* are expressed as ratios of *expected* profits to (a) the money required to extend a given production and (b) the present market value of such an extension (obtained by capitalizing profits at the market rate of interest) respectively, we have, it seems to us, the conceptions employed by Mr J. M. Keynes as “marginal efficiency of capital” and current rate of interest. *The General Theory of Employment, Interest and Money*, bk. iv, ch. 11, pp. 135–146.

continuous unchanging scheme Here and there we have referred to features in the scheme which would not be visible in a stationary economy but we have mentioned them and shown them in our diagram (K) on the ground that they are "potentially" present. We have said, for instance, that in a stationary economy there is no capital market, and, of course, though there is reinvestment of capital there is no new investment: we have shown investment in the diagrams because it lies there "dormant" so to speak, the conditions of a stationary equilibrium being such that there is no inducement for it to "wake". We must, however, now make the picture more realistic and indicate the main changing features. Our study, so far, has presented us with a smoothly running system. now we must indicate where its instability lies, or, rather, indicate some of the conditions of variation.

In the *first* place, there are the changes which might be introduced through some external or "natural" catastrophic occurrence such as a failure of the harvests, earthquake, flood, drought, etc. Such occurrences have the effect of depleting to some extent the equipment or resources standing in the various squares of our diagram: they will, of course, make depletions of capital value, though they may cause increases, and value may be regarded as running down through the "waste" pipes or coming up through the appreciation lines. Some "natural" events may, of course, increase the stocks and these increases also may cause variations in value, upwards or downwards. These changes will cause changes in flows of resources, changes in flows of money, changes in the ratios of flows, prices, and the rates of profit and yield. We are not concerned with the nature of these changes at this juncture: we are merely concerned to show the locations of various disturbing or disequilibrating factors. If our diagram showed in detail the holdings of resources by individual units the distribution of these changes would be seen to be widely scattered and widely varying in magnitude.

In the *second* place there are the changes brought about through a new idea being conceived with respect to production. Business men and inventors are for ever attempting to discover new ways of doing things (new uses of old resources) or new things to put on the market. These innovations are disturbing elements. New knowledge is like an accession of new power.

Now a new idea in business has a money value or, to be more precise, it reveals a new possibility of "pattern making", a new possibility of resource-combination. It will only be prosecuted if there is a possibility of the sponsor receiving a larger income than he is at present receiving. If we assume a perfect equilibrium into



which the innovation is introduced the increase of profit can only be won if the new combinations or patterns of resources at old prices and the new products at old (or "substitute") prices are not identical as in the equilibrated system.

Another way of expressing this is to say that the one who holds the new idea revalues in his own mind the resources which he possesses and so works in a pattern of values different from that which has been determined in equilibrium<sup>1</sup> The present value of the expected "increments" of income is the capital value of the new organization and this value can be raised in the market, from the banks or from the sponsor's own resources, and so the "profit" can be acquired. At first, then, we may say that there is an increase of the total capital values in existence, in the minds of the members of the community. It is a "bulging" of capital value at one point, the point where he is who has the idea.

It is clear that in a state of equilibrium there is equilibrium between capital values, prices of resources and prices of products. A new idea disturbs this equilibrium by increasing the capital values seen. This new total of capital value being out of equilibrium, a readjustment must take place in the price and income scheme. In other words a new idea leads to a new scheme of valuation of factors and products. During the process of transition "gains" and "losses" are made: that is, men find that their expectations and realizations are not identical.

New ideas enter into the economic system not alone through "production" but also through "consumption". Analytically, however, there is no difference in the types of reaction, for, as we have seen, there is no analytical difference between production and consumption. When a person's desires change he revalues his resources and reallocates them. No "credit" is necessarily required for a consumer to change his mode of living: he usually operates in different parts of the market. Changes of taste

<sup>1</sup> Professor Schumpeter's discussion is different from this. The new idea needs capital to be put into the market. Professor Schumpeter says that this requires "credit" to be created. We say that the new idea has a value and can be sold—for money which is in existence. That the sponsor (or "entrepreneur") may have it is not due necessarily to his having reaped dynamic gains before, but to his deciding to deflect the money which he holds in reserve, as capital or hoards or deposits in the bank. Professor Schumpeter's suggestion of the necessity for credit creation seems to us somewhat similar to Major C. H. Douglas's suggestions. Cf. Schumpeter, J., *Theory of Economic Development*. Douglas, C. H., *Credit Power and Democracy*. Tavistock, Marquis of, *Social Credit* (pamphlet). Our analysis also reveals, we think, another weakness in the Social Credit analysis, namely, that it fails to show that a new method accedes to value and reduces the value of old methods necessarily. "Progress" means destruction of values as well as gains.

are dynamic elements and they bring with them unforeseen gains and losses throughout the system until a new equilibrium is established

The changes in the economic system to which we have referred may be regarded as originating at certain points in the system and the reactions may be regarded as filtering through the system or passing through it in the form of ripples and oscillations. The *third* type of change to which we must direct attention is a change of a more general type; it is, perhaps, best visualized as a general welling-up or recession of values of resources held by units (a swelling or contraction of the values enclosed in the squares in Diagram L), and a general swelling or shrinking in the streams flowing from unit to unit, with a general change in the ratios of flows and the ratios of flows to capital values invested and held

Such a general sea-change can only be due to the "climate" within which the system operates: if the weather sets "fine" after "storm", changes in one direction take place and if it sets "stormy" after "fine", they take place in the other direction. This "weather condition" is the condition of certainty or uncertainty with regard to the future.<sup>1</sup>

Occasions when these changes in values are of great significance are numerous in history. Whenever there is a real fear of war one of the first reactions is a slump in capital values following the change in income expectations. This slump in itself means a fall in purchasing power available to individuals and other units in the sense that they cannot realize so much money by the sale of their assets. The second reaction is the widespread hesitation to invest in wonted ways so that money falling in, and ordinarily available for and employed in reinvestment, is not so employed but tends to collect as hoards—money left on deposit in banks. Those who supply for immediate markets, not being so much affected by the uncertainty, are able to draw on these hoards as the "sales-returns" on their consumables enhanced in prices. Thus we have a reorientation of money disposal. In times of enhanced security the changes take place in the opposite directions. Hoards are depleted and investments are sought; capital values rise and the more they rise the more they are sought. Money is withdrawn from consumables and enters the capital market where the capital profits are alluring, consumables become a drug in the market and securities grow more scarce. In these ways, huge movements of exchange value take place, values "well up" in some parts of

<sup>1</sup> See Pigou, A. C., *Industrial Fluctuations*, chs. vi–vii

the system and subside in others ; large transferences take place in the security market, absorbing or releasing money for spending, hoarding, or investing in new enterprises, or the expansion of old ones.

In describing Diagram K, above, we referred to a " flow-line ", " new gold and bank money ", as a possible source of instability. For the moment we are only concerned with a metallic money and the superstructure of bank money which reposes upon it. The peculiar feature of this line in the diagram is that it emerges from the point at which " products " emerge. This is because the metal of which a money consists (as a basis, as in a Gold Standard currency system) is a product of a mining industry. It is issued in response to demand for use in industry as a raw material and in response to its value as money. The first fact alone would be responsible for a certain degree of instability but it is the second fact which is of greatest power. Even if (which is not conceivable if the metal is made into money freely) the response of the mines were only due directly to industrial demand it would, by a secondary influence, be indirectly due to its being used as money also for the value of the metal as metal and its value as money would tend to adjust themselves. When, however, we consider the demand for metal as money we are at once thrown over to the consideration of the general demand for money as expressed in the goods and services being sold in the market. There are continual changes in quantities offered : we may say—though we cannot measure precisely—that the economy tends on the whole to expand and this tends to bring down the price level. Without subscribing to the old simple Quantity Theory of the Value of Money and bearing in mind what we have said of the price structure as a better concept than the price level, we must observe that there is a correlation between mining activity and the price level. In an economy which, owing to a variation in its " magnitude ", suffers variation in its price level, the money which is " produced " in mines will come forth in larger quantities when the price level falls. With this efflux of new metal and the new price scheme, there are new quantities of bank money erected upon it. If the metal could " ooze " in gently as the price level fell and gently distil itself at once all over the system in all people's holdings, there would be no disturbance. But as it comes in at some particular point in the system, and as its response is not perfectly adjusted, there are variations in the price structure and price level which are inevitable.

Perfect equilibrium assumes a high degree of sensitiveness in reactions through the system, a rapid response to stimuli. Response in the economic system is not perfect. Price is the great indicator

of variations in supply or demand and at some points this indicator is sticky. We cannot here enumerate all of the cases of such stickiness, but one there is to which we shall later have occasion to refer again, namely, the interest rate. In the banking system there lie what we have called above<sup>1</sup> hoards of money (deposits and unadvanced loan money). These hoards are increased either by more "saving" or by "less investing" and they are "reserves" upon which investment can call. In a stationary economy they would remain stationary, but if for any reason there is an increase of investment it takes place largely at their expense. Perfect adjustability, of course, would result in a new adjustment of saving to the new investment and the quantity "in hoards", but, instead, the increased demand for investment money does not cause the indicator (interest rate) to move, with the result that the *market rate of interest* and the *equilibrium rate of interest* move apart.<sup>2</sup> The phenomenon is described by some as due to the elasticity of currency *volume*.<sup>3</sup>

This variability in the economic structure shows itself in two ways which are of particular interest to us here. In the first place it shows itself in the variations of prices, both service prices or "rents" (wages, profits, interest, dividends in ordinary senses, as well as the prices of consumables), and capital values. Instead of seeing in our diagram then a smoothly running system of flows and a settled, calm level of values in the "reservoirs" we see turbulence, more or less. Men make their best estimates but realize, in actual experience, more or less than they anticipated: they find themselves with "windfalls" (positive and negative), both in their incomes and in their capital values. Some economists regard the deviations from expectations as profits and losses; some prefer to regard these terms as applicable to the deviations from a kind of mean level of the turbulent flows. We prefer to regard them as variations of capital values and income values respectively. But whatever they may be called they are the results of the dynamic elements in the economic data or defects in the mechanism. They arise only in periods of transition, in theory, from one equilibrium

<sup>1</sup> See p 35, n

<sup>2</sup> This is the same distinction as that made by Mr Keynes (*Treatise on Money*, bk iii, ch ii, vol 1, p 155). He uses the terms "natural rate" and "market rate". We prefer Dr Hayek's "equilibrium rate" (*Monetary Theory and the Trade Cycle*), for the former of these since Wicksell, who first introduced the conception of two rates out of adjustment, used the term "natural" as appropriate to a non-monetary economy and "money rate" as the equivalent of the market rate in a monetary economy (See Mises, L von, *The Theory of Money and Credit*, p 355).

<sup>3</sup> Hayek, F. A. von, *Prices and Production*, Lecture IV. We think there is a certain value also in considering this phenomenon as a case of *inflexibility of interest rate* to change of investment demand.

to another. But as we are always in transition they are always with us. There is always some one who receives more (and some one receiving less) than he expected, there is always some one receiving more (and some one less) than he would obtain in equilibrium.

There is a question in the minds of some economists who separate "income deviation" from the income as to whether this deviation should be regarded as income or capital. To us it seems that the answer to this question depends entirely upon the context of the discussion. If we are considering the "flow" of income it is income; if we are considering the moment of acquisition, it is capital. All money income is, in our analytical scheme, an accretion of capital; it is an addition to the stock of resources held and is, *pace* the stationary economy, free for allocation in any direction which pleases its recipient.

In actual fact, even in a stationary economy, the basic conception of income is that of an addition to capital value, but along with the addition there is, of course, a subtraction of value which the income makes good.

During every moment, owing to decay, wear, and tear, in a stationary economy there is a continual "slipping away" of value and a constant increase of value in the resources which can replace the waste. Income, then, is to be regarded in a stationary economy as something like the flow of a tank, keeping the level steady against the outflow. In physical terms it is the flux of physical patterns, in psychical terms it is the flow of satisfaction and in monetary terms it is the flow of value-in-exchange.

In the second place the variability of the economic structure reveals itself in the variability of the rate at which future values are discounted or the rate of interest. We are not at this juncture concerned to explain this rate of discount; all that we wish to show is that it exists and that anything which causes it to change has an effect on the "capital structure" or production structure by altering the relative valuations of present or current resources and future products. Since the longer the period of time over which an investment is being made the greater the influence of this rate of discount, the greater will its effects be on the purchase of more distant satisfactions (as in durable consumption goods, or the purchase of annuities) and the more distant investments (mining, iron and steel, shipbuilding, etc.) than on the shorter period investments in consumption goods and production. This type of differential variation is a characteristic feature of those variations in economic quantities known as industrial or trade fluctuations.

In viewing the flow and variation in volume of exchange value we have hitherto considered the scheme of ordinary buying and selling

only ; we have assumed that all transferences have taken place through the business organization and have been the result of ordinary contractual arrangements. A complete picture of the scheme requires, however, that we include the transferences effected through voluntary societies and the State

There are certain so-called voluntary societies which are, in fact, nothing more than business organizations. When men join sports clubs, dramatic societies, and such like bodies, paying contributions on fixed scales or according to their ability or willingness, and receiving benefits according to a scale, or according to their desires to enjoy them, they are, in effect, buying services. The fact that they may pay varying sizes of subscription and take varying quantities of benefit or service does not alter this basic contractual relationship. variations in "prices" that appear in this way are simply voluntarily accepted discriminations in prices. Such societies, then, societies of the mutual benefit order, should, strictly speaking, be placed in the category of business units. The only bodies which require to be specially noted are those which exist for the simple purpose of transferring property in return for nothing. these are the charitable and philanthropic bodies

The characteristic of charitable organizations is that they receive their means as gifts and disburse their means as gifts, that is, in each transference there is no counter flow to act as inducement. Gifts are single way transferences and exchanges are double way transferences. It is not necessary that gifts be made through organizations : there is, in fact, much transference from individual to individual but in our modern society a very large amount of this type of transference is effected through organizations such as charity societies, hospitals, etc <sup>1</sup>

As in the case of certain voluntary societies so in the case of certain State services it is possible to consider them as belonging more properly to business organization. The removal of refuse and the supply of water may be taken as cases in point. Though, in form, the charges made for these services are taxes yet there is no reason to think that here again the discriminating charges are not such as might possibly be paid if the services were rendered by trading organizations. The State, in short, is, to a certain extent a form of business organization.

To a certain extent also, the State may be regarded as a large scale charitable organization acting as an agent of philanthropy. Probably, for example, the relief of destitution may, to a large extent, be so regarded.

The characteristic of the State's administration is, however,

<sup>1</sup> See Appendix for the analysis of "voluntaryism".

compulsoriness as opposed to the voluntariness of charitable societies, and its characteristic modes of transference are the tax and the State benefit, the former collected with no guarantee to the payer of a compensatory benefit and the latter given with no mulcting of cost. The redistribution of property which is characteristic of the State is primary and compulsory.

Though the State's characteristic is the wielding of sovereign power and the exercise of compulsion, yet, to a large extent, it enters (as indeed do voluntary charitable bodies), into contractual arrangements and buys and sells, borrows and lends, in the ordinary market. Thus, in any visualization of the scheme of flows of exchange value it is essential that the State should be seen as a body which bargains as well as compels, but, no matter how extensive its contractual arrangements, the core of its administration is the compulsory transference of property. The State, for example, frequently enters the money market for the raising of loans on ordinary contractual conditions, and, in some cases, it attaches real resources as guarantees of its intention and future capacity to pay interest, usually, however, the interest on a loan is guaranteed by the State's future taxing capacity.

One peculiar mode of raising revenue must, however, be mentioned, not because it is not a means of taxation but rather because it is so often not regarded as taxation, this is the method of issuing fresh legal tender whose face value is greater than its cost of production as, for instance, in the printing of paper money. There is no power in a country to prevent the sovereign authority issuing any quantity of money it desires to issue and compelling its acceptance. It makes no demand on any individual for a tax contribution, but it absorbs from the community a quantity of resources determined by the price scheme and the amount of money it issues. The price scheme changes as a result, of course, but the State receives its resources.

With the causes that determine changes in the flow of exchange value we are not primarily concerned in this chapter. All that we have intended to do is to present a picture of the actual flows of money and money's worth in the economic system. We have presented several partial views but now we have covered the field. To attempt to present a diagram showing all that occurs in such a flow system is, perhaps, too ambitious, but it may be possible to present one showing the main features. Such an attempt is seen in Diagram M.

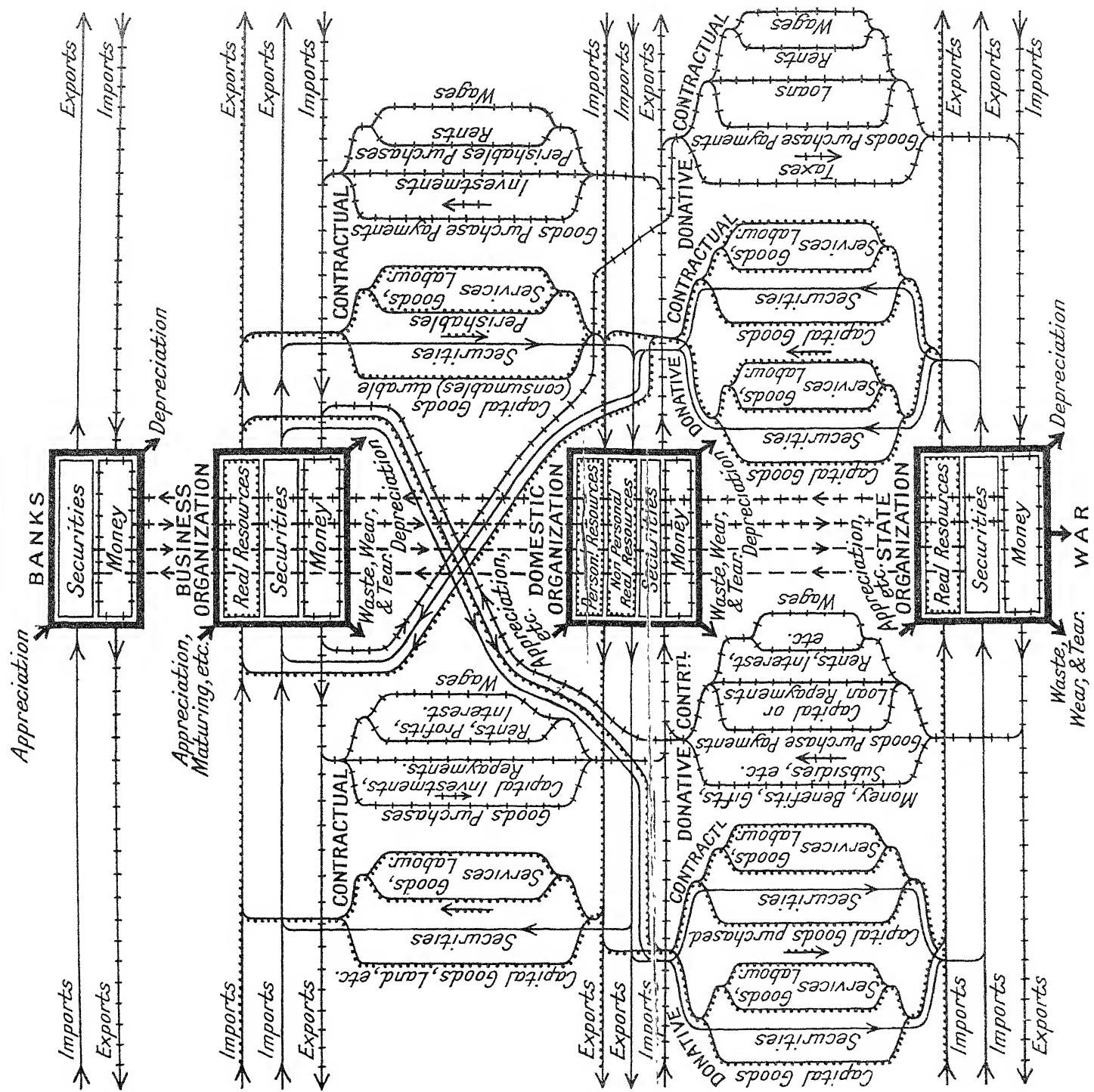
In some ways it may be regarded as a multiplication of Diagram L. In that diagram we showed the flows from domestic units or producer-consumers to and from the business organization. We have

indicated in subsequent discussion that in charitable organizations we have the same kinds of flows but that they are not regulated on contractual terms: they are donative. Also we have seen that the State, though conducting much of its work on contractual lines, is characterized in its administration by the use of its sovereign power to enforce transferences. There are thus three modes of effecting movements of exchange value from unit to unit, (1) by sale and purchase, (2) by voluntary gift, and (3) by compulsory contribution or acceptance of benefits, and in a diagram purporting to be comprehensive these three modes need to be exhibited.

To show three modes of transference amongst four types of unit—the domestic, business, charitable, and State units—would make a diagram so elaborate that it would be incomprehensible. We have, therefore, simplified the diagram by regarding charitable bodies and the State as one. We have shown that the characteristic of the one is voluntary redistribution of property and, of the other, compulsory—it will not do much violence to logic if we regard the voluntary associations as Voluntary States and regard their characteristic transferences as donative. If it is remembered that the donative flows include the voluntary and compulsory gifts, the diagram will lose little of its value in demonstrating the flow and reservoir structure of our economic system.







----- REAL RESOURCES (Human & Non Human)

----- SECURITIES

+++++ MONEY

DIAGRAM M



### SECTION III

#### *THE INTERNAL ADMINISTRATION OF RESOURCES*

##### CHAPTER I

##### INTRODUCTORY

In the administration of their resources in an ordinary economic system the objective at which men aim may be described, as we have seen before, as physical, psychical, or financial. The first two types of objective are common to all systems of administration of resources, but the third exists only in a social system in which there is exchange and money is employed.

The last two sections have shown that men pursue the establishment of (*a*) certain physical patterns of resources at one moment of time or flowing patterns of physical resources through a period of time, (*b*) certain states of satisfaction at a moment of time or flows of satisfaction over a period of time; (*c*) certain stocks of money's worth at a given moment or flows of money's worth over a period of time. It has also been implied that, though men aim at the establishment of a physical, psychical, or financial position at a given moment this aim is not an ultimate aim but one which derives its importance from its bearing on the *flow* of physical resources, satisfaction, or money. In short, men aim at income not capital, since life itself is a flow or stream of being and doing.

It has further been demonstrated that the maintenance of a flow of goods (or services), satisfaction, or money requires the continuous outlay of goods, the continuous sacrifice of alternative satisfactions and, ordinarily, the continuous expenditure of money. To maintain a supply of bread it is necessary to maintain a supply of flour and labour, etc., to obtain satisfaction through clothing it is necessary to sacrifice satisfaction in housing or some other direction; to assure satisfaction in the future it is necessary to sacrifice satisfaction in the present; to obtain money from the sale of goods in a business it is necessary to spend money on the purchase of resources used in the production of the things sold.

This condition presents us with two conceptions which are

fundamental in the study of the principles of administration, the conceptions of input and output, expenditure and receipts, outgo and income, cost and return, sacrifice and benefit, factors of production and product, means and end. These seven pairs of correlatives (and there may be others) all express a common idea, the last being the widest expression of it ; to attain an end, means must be employed and both means and end have significance to men, the significance of means being derived from that of the end pursued.

The resources of a person may be regarded as (*a*) physical resources, (*b*) money's worth, or (*c*) satisfaction-giving means. In his administration or utilization of these resources man may be regarded as (*a*) producing a physical result, (*b*) producing a financial result, and (*c*) producing a result measured as satisfaction. The final test of the efficiency of an administration is the satisfaction that man derives from the production of money or money's worth, and the production of a physical result are means to that end.

The first essential condition of a person's attaining his end is a knowledge of what can and cannot be done with the resources he possesses. The physical properties of materials are not things that he can alter, he must adapt himself to them. The prices that other people give him for his resources are also things to which he must adapt himself ; he may determine the quantity of a commodity or service which he will buy or sell at a price, but he does not determine what others will give him. Thus, in studying the administration of resources by an individual or other unit, it is necessary to study the correlation between resources employed and the results attainable in physical terms and in financial terms. Then we may study the principle of administration as applied to satisfaction production. Ordinarily these studies are regarded as the studies of production of means and consumption of means respectively ; here they will be regarded simply as production—of means or ends.

Chapter II will be devoted to the consideration of input and output from the physical point of view ; Chapter III will be devoted to the study of input and output in terms of money ; and Chapter IV will be concerned with the production of maximum satisfaction.

If there are three kinds of "units" in which input and output may be measured it will be seen that there are nine kinds of ratios of input to output (and nine of output to input) that may be expressed. Each type of input may be related to three types of output and each type of output to three types of input.

Physical output may be related to physical input, financial input

and psychical or satisfaction input. Financial output and psychical output may be related to inputs of their own kinds respectively.

These ratios may be inverted and so give the "cost" per unit of product instead of the output per unit of cost.

As we shall see in the following pages, there are various ways in which the quantities of the inputs and outputs may be expressed, and these give a considerable number of possible ratios, all of which have their own special significance. We shall, however, be mainly concerned with what we may describe as the "pure" ratios, in which both input and output are expressed in units of the same type, physical input and physical output, financial input and output, satisfaction input and output. Chapter II is concerned with the first, Chapter III with the second, and Chapter IV with the third. The "mixed" ratios (e.g. physical input and financial output, or financial input and physical output) we shall discuss incidentally, but it is clear that they are only of derived significance. The physical ratio is the one of first importance in dealing with physical possibilities, the financial ratio is the one of prime significance in business, and the psychical ratio is the supreme ratio in the sense that all living consists of making this ratio the most satisfactory.

## CHAPTER II

### THE PHYSICAL LIMITATION WITHIN WHICH MAN ADMINISTERS HIS RESOURCES

We have seen that the process of living is the process of pattern making, the employment of physical resources of different kinds in varying quantities in various places at various times. These patterns of living may be envisaged either as patterns of men and things at a given moment of time or as patterns of disposal of men and things over a unit period of time. Thus, we may think of a farm organization as "x" acres of land, "y" labourers, "z" horses, etc., or we may think of it as a year's disposal of "x" acres, a certain number of days' disposal of men, a certain number of horse-days' disposal, etc. In either case, however, it is an easy matter to make a diagram which represents the physical aspect of an economic pattern. All that is necessary is to construct a series of lines radiating from a point, each line representing a particular kind of resource and having a section cut off that represents the quantity employed.

In Diagram N such a pattern is presented. There are given eight factors or resources of different kinds marked *a, b, c-h*. Along each of these lines certain distances are marked representing the quantities of *a, b, c-h*, respectively, that are employed. The points indicating these distances are joined and the result is an irregular polygon: this pattern of radial lines is a representation of an economic unit. The diagram shows three such patterns, that is, it represents three different units or organizations employing different quantities of the same kinds of resources.

Now an economic unit may be presented not only as a pattern of resources employed in the pursuit of some end but also as a pattern of results attained or products. A business may be regarded as a group of factors "being used" or as a group of products "being produced". If the radial lines *a, b, c-h* in Diagram N are interpreted as results then the diagram will serve to illustrate this mode of considering an economic unit.

These patterns show several features of all economic organizations at once. In the first place they show what is a universal fact that all economic units are *groups* of various kinds of resources or products.



It is impossible for one factor to be employed alone and it is impossible for one product only to be produced : both factors and products are multiple

That it is impossible to employ one single factor in any activity is obvious. Whenever a person does anything he requires at least two factors, his own energy and the land (or aeroplane) upon which he stands or sits ordinarily he requires many more factors than

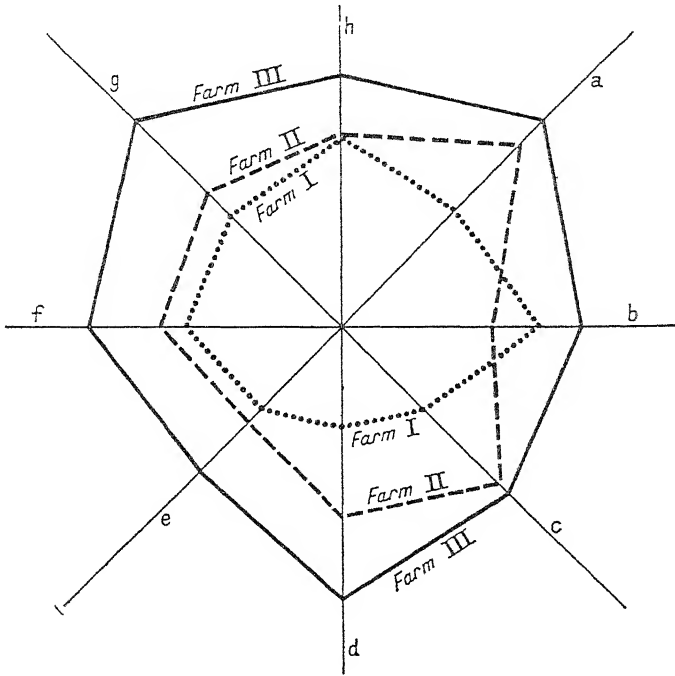


DIAGRAM N

two. That every activity involves more than one product is not so obvious, but it is equally true. It is usual for us to concentrate attention on some particular product or products, and so it is usually the case that we speak of a boot factory or a wheat farm. This, however, is because we have in our minds some conception of values and we only consider products that are of value. From a purely physical point of view we have to include in the products of a factory not only the products of "main interest" (main products), but

others of "by-interest" (by-products), and others still of "no-interest" (waste-products). To be precisely correct we shall also regard as the products of activity the impaired machines, depleted stock, etc. The product of any organization's activities is the whole pattern of resources which exists when these activities are finished.

There was a time when the tar that is produced in the making of coal gas was regarded as a waste product: to-day it is regarded as a valuable product. The fact that it has changed in value has not converted tar into a product, it has merely turned it from a waste product to a by-product and in some cases the gas, even, has been degraded from the position of main-product to that of by-product in favour of the erstwhile waste product. From the "physical" point of view products are all things produced, *regardless of their significance*

It follows from this, then, that all products are, in this sense, *joint products*, that physical necessity determines that when one thing is produced something else is also produced. It also follows that everything which is produced involves *joint requirements*<sup>1</sup> This does not mean, of course, that whenever a certain commodity is made some other particular product is always associated with it in the same proportion, nor does it mean that whenever a thing of value is made there is always a joint product of value. Nor, looking at the factors, must we infer that when a certain particular product is required there is only one kind of factor group that can produce it.<sup>2</sup> It does mean, however, that "single results" are impossible and "single-factor production" is impossible.

A further implication of this fact, that every product requires joint factors, is that it is impossible to assign to any factor a *share* of the product of all factors together. It is frequently urged that landlords, capitalists, and workers should share the product of their collaboration (the "product of industry"), according to the contributions made by their respective factors. Such a contention is based on the crude conception that factors "add" their contributions when, in fact, they contribute jointly. When two and three are multiplied together as "factors" they "produce" six, but it is

<sup>1</sup> That is, all production involves *joint supply* (of "joint products") and "*joint demand*" for all "factors". Supply and demand are, however, market terms, and we are here concerned with physical possibilities only. See Marshall, A., *Principles*, pp 388-393.

<sup>2</sup> That is, the "coefficients of production" (Walras) may be variable. "Fixed coefficients" imply that the quantities of the various factors per unit of product remain constant whatever the quantity of product produced. The variability of factors is known as the *Principle of Variation*. (See an important article on this subject by Dr. J. R. Hicks, "Marginal Productivity and the Principle of Variation," *Economica*, 1932.)

impossible to say which of the numbers two or three "contributes" the "greater share". If either of them is removed altogether the product is zero

This does not mean, of course, that it is impossible to "impute" productivity to a single factor, in fact, it is commonly done and we say quite correctly that one person is more productive than another, one field is more fertile than another, and so on. In every case, however, when we "attribute" or "impute" production, the precise measurement which we make is of the *change in the whole production* which a *change in a factor brings about*. Thus, if we substitute worker B for worker A in an organization and the product is increased, we say that B produces this increase as well as "contributing" as much as A contributed. If we take A away from the organization we attribute to him the difference in the product

"Imputed productivity" is not "actual" productivity. Imputed productivity is always "the change of product" brought about by a "change of factor". If 2 is increased by  $\cdot 1$  the product of 2 and 3 is increased to the product of 2.1 and 3, that is, from 6 to 6.3. This increase of  $\cdot 3$  is not the product of the 1 alone - it is the product of  $\cdot 1$  and 3. The position is stated accurately in this way: "An increase of 2 to 2.1 causes an increase of the product of 2 and 3 to the product of 2.1 and 3 or, more shortly, the increase of 2 to 2.1 causes an increase of  $\cdot 3$  in the product of the two factors 2 and 3."

The second fact which is revealed, when diagrams are drawn representing the patterns of resources employed or the patterns of products, is that there is no common unit which can be employed for all the factors or all the products. An inch may be used to represent a man's labour for a day, the use of a plough for a week, a ton of manure or a ton of seed, but there is no common physical unit which can be employed to measure all. We might, in fact, measure many of them by weight and this would be a valuable common measure for some specific purpose such as transportation, but we cannot employ a weight unit when we are considering productivity. The differences in *nature* of the various factors are significant, and no common unit is possible. Each factor must be measured in its own appropriate unit of quantity and the scale employed to represent the units of the various factors or products must be fixed arbitrarily; thus, one inch may represent a unit of each factor or each product but the units must not be regarded as equal. The particular shape of the polygon, therefore, has no significance; it may be regular or irregular.

It follows from this fact (that there is no common unit for

measuring all factors or all products) that it is impossible to express in a single number of units the total quantity of all factors employed or the total quantity of all products. It is indeed, impossible to find a total of one horse and one plough except the relatively insignificant one of "two things."

If it is impossible to measure by any standard physical unit the total quantity of all kinds of factors or products it follows, further, that only in particular cases could we conceivably compare sizes of different units with any precision while, in fact, it is utterly impossible, in actual life. If two units, say two farms, employed the same kinds of resources exactly and one of them had, say, 10 per cent more of every factor than the other, then we could say it was 10 per cent larger than the other. Even if the percentages were not uniform so that one farm had 10 per cent more land, 20 per cent more labour, etc., than the other, so long as it had a larger quantity in some and not less than an equal quantity in the others, we could still say that it was the *larger* farm, though we could not say how much larger. But if one farm had a larger quantity than the other in all factors but one, and in that one had a lesser quantity, it would be impossible to say which was the larger farm.

Businesses are frequently measured by reference to a single factor or a single product. Farms are compared in acreage, spinning mills in spindles, collieries by tons of saleable coal, but all of these units use other factors than those used as basis of measurement and collieries produce other than saleable coal. The features employed for measurement purposes are selected because they are supposed to be the more "significant" features but, from a "physical" point of view, they are not adequate or full measures. A man's size is not measured by height alone; some attention must be given to girth; and so with a farm or factory, other factors than land or spindles must be considered.

An examination of diagram N will show that, assuming the polygons to represent three farm patterns, Farm III is greater than Farm I and Farm II because, in every factor, Farm III exceeds both of the others. It is impossible to say how much larger Farm III is than either of the others because the excesses are not equal in percentage. Whether Farm II is greater or less than Farm I it is also impossible to say, since though Farm II exceeds Farm I in factors *a*, *c*, *d*, *e*, *f*, *g* and is equal in factor *h*, yet since, in factor *b*, Farm I is the greater, no decision can be made: no one can say whether I's excess of *b* outweighs II's excesses of the other factors or not.

Having made these general observations, we can now proceed to the investigation of the quantitative relationships that may

exist between input and output measured in physical units. The business of the administrator of resources is to make the *best* pattern that is possible, given a certain quantity of different kinds of resources, but, in order that he may choose the best, he must have technical knowledge of what can be done.

The problem, then, as it presents itself to the administrator, is that of selecting from a series of patterns which may be presented in a pseudo-algebraical form or in diagrammatical form as under :—

|                  |                  |              |
|------------------|------------------|--------------|
| $2a, 3b, 5c, 4d$ | together produce | $4l, 5m, 2n$ |
| $3a, 5b, 4c, 6d$ | „ „              | $6l, 7m, 3n$ |
| $5a, 5b, 3c, 8d$ | „ „              | $8l, 5m, 6n$ |

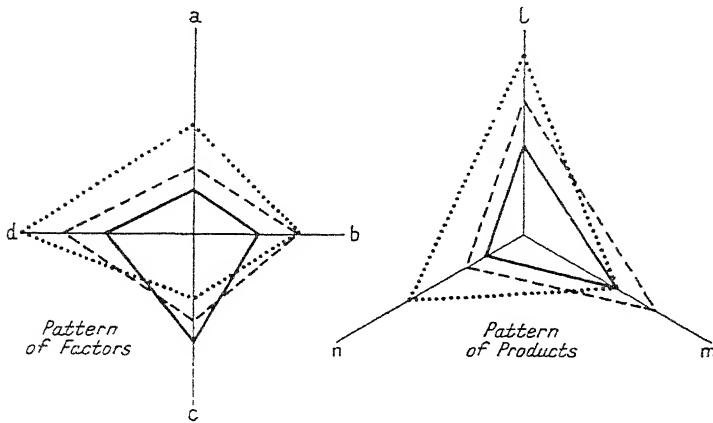


DIAGRAM O

The principles of selection are not the subject matter of our present discussion since they involve consideration of values of resources and products. Here we are simply concerned with the physical aspects of administration, the physical facts that the administrator must accept and in accordance with which he must act.

Patterns of resources may vary among themselves in three ways : (a) qualities or types of resources, (b) size, (c) relative quantities of the various resources or "shape". Patterns of products may vary in the same three ways. The variations may be, in a given comparison, in one of these directions only, or in two or three together.

From the simple physical point of view it is obviously impossible to compare the ratios of input in an organization which employs

*different kinds of resources* For example, if a manufacturer substitutes a machine for four workers and increases his output it is impossible to say which of these organizations, the former or the latter, gives the lesser ratio of input to output or the greater ratio of output to input. No one can say whether the resources employed have been increased or diminished by the said substitution, and consequently no ratio can be calculated for comparison. Clearly, the choice of method here is a choice of values. Similarly, it is impossible to compare two organizations in the matter of input and output if their *products differ in kind*. Because it is impossible to use a common unit of measurement of dissimilar products it is impossible to calculate the necessary ratios. We shall commence our study, therefore, with the investigation of the relationship between patterns of resources and their consequent patterns of products in cases where the patterns of resources and patterns of products are made up of the *same kinds of resources and products respectively*. The cases represented in the diagrams above (Diagram O) are such as we shall investigate here, where all the resource-patterns consist of factors *a*, *b*, *c*, and *d*, and all produce-patterns consist of products *l*, *m*, and *n*. Such comparable patterns of resources and patterns of products vary only in "size" and "shape".

The first relationship that we must consider is that which exists between the change of product pattern and the change in size of the factor-pattern necessary for its production.

It is frequently asserted that in some industries the product pattern increases in greater proportion than the factor pattern, in some it increases in less proportion, while in others it increases in equal proportion. These assertions are found in discussions of the economies and diseconomies of large scale organization.

A simple change in size of a pattern of factors or resources employed implies, and can only imply, an equal all-round percentage change in all the resources: if the proportions or relative quantities are altered then we have a change of shape as well as size. In the same way a simple change in size of the pattern of products implies a uniform all-round change in all the products. Thus an examination of the relationship between change of size of pattern of factors and the associated pattern of products must be an examination of the result of making an all round increase or decrease in the factors employed.

If we consider a chemical reaction it would seem that we have an example of this kind of situation. When the reagents mixed are increased in uniform proportions the products also are increased in uniform proportions and in equal proportions with those of the

reagents It would seem to be self-evident that it should be so in all cases, and some writers have laid it down as a self-evident proposition with regard to all economic organizations In actual fact, however, it is physically impossible to expand at a uniform rate any organization of factors which is of interest to the economist.

When the chemist increases the quantities of all his reagents he is, from the economist's point of view, only increasing *some* of his resources. The economist is concerned, for example, with the amount of heat he uses, the amount of apparatus, the amount of labour—and these the chemist ignores—and we know that these are not increased in amount by a percentage equal to that of the increase of reagents employed. In every pattern of resources viewed in its completeness, this is the situation. When, for example, the machinery of a factory is increased we know perfectly well that the room in which it is housed is not increased in the same proportion, as a rule, and, even if it is, we know equally well that the quantities of bricks and labour employed are not increased in the same proportions It never happens, and never can happen, that an equal all round change in all factors takes place.

To go any further with the discussion of the relationship between the simple size of an organization and its product (the physical patterns of both) is a perfectly futile procedure. Sometimes writers employ index numbers and attempt to define the physical change in terms of an *average* rate of increase of all factors, but since the calculation of index numbers involves the employment of weights and all weights are concerned with significance it is clear that, whatever value such measures have, they cannot be regarded here since they are not, strictly speaking, physical measures. As we said above, there is no common unit in which different factors or products can be measured <sup>1</sup>

<sup>1</sup> This is implied in Marshall's conception of a dose in his note on p 171, *Principles* "We thus regard the dose as made up of so much labour of different kinds, and such charges for the use and replacement of capital, as will together make up the value of, say, ten days' such labour, (days' unskilled labour of given efficiency), the relative proportions of these elements and their several values in terms of such labour being fixed according to the special circumstances of each problem"

Professor Pigou (*Econ of Welfare*, Pt. II, ch II, par 2) uses the concept of physical increment of mixed resources in his study of "marginal social net product" "The most obvious element in the marginal social net product of any flow of resources employed in any occupation is the direct physical net product This is equal to the difference between the aggregate flow of physical product for which that flow of resources, *when appropriately organized*, is responsible and the aggregate flow of physical product for which a flow of resources differing from that flow by a small marginal increment, *when appropriately organized*, would be responsible" (p 115) He quotes Professor J B Clark to the same effect (*Distribution of Wealth*, p 250) Our contention is, of course, that there is no such thing as a "dose" of mixed physical resources.

This is a very important conclusion for it means that, from the physical point of view, every change in a pattern of resources must mean a change of shape. A change of shape of a pattern of factors will obviously lead to a change in the shape of the pattern of products, and since changes in shapes of neither factor nor product patterns can be measured, it follows that it is impossible to discuss the relationship between total factors employed and total products ensuing. *We can only discuss the quantitative relationships between particular factor changes and particular product changes.*

The case that we have to consider then is that of the changes in

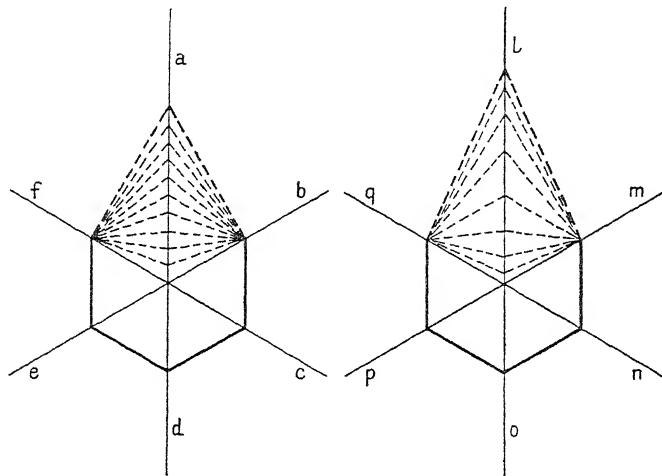


DIAGRAM P

the quantity of one product ( $l$ , say) that results from changes in one factor ( $a$ ).<sup>1</sup>

Let  $a, b, c, d, e, f$  be necessary factors in the production of  $l$ ; if any one of these factors is absent, there is no product  $l$  at all. There may be other products,  $m, n, o$ , etc., but we are neglecting the consideration of these. If we commence with a pattern of production consisting of all the factors but  $a$  we shall have no units of  $a$  and no units of  $l$ , and we may take this as the starting point. The diagrams above (Diagram P) show these original patterns of resources and products in full lines. The broken lines are drawn to show how the pattern of resources is changed by the addition

<sup>1</sup> Professor Pigou calls this the "law of diminishing returns to individual factors of production" to distinguish it from the "law of diminishing returns to resources in general invested in a single occupation". Ibid, p 704



of successive equal-units of  $a$ , and the pattern of products changes as these successive changes of the pattern of resources are made.

In the table below the data of an imaginary experiment are given in which all factors are kept fixed in quantity except one, factor  $a$ , which is varied from 0 to 24 units by successive additions of one unit. Column (2) gives the number of "doses" of this factor at the successive stages of the experiment, and column (1) gives the product  $l$  resulting, all other products (joint, by- and waste) being neglected. It should be noted that the figures are purely imaginary and no claim is made for their being typical of

| Order of Reference | Total       |            | Increment of |        | Rate of Increase of |        | (1)    | (3)     | (5)   |
|--------------------|-------------|------------|--------------|--------|---------------------|--------|--------|---------|-------|
|                    | Product "1" | Factor (a) | Product      | Factor | Product             | Factor | (2)    | (4)     | (6)   |
|                    | (1)         | (2)        | (3)          | (4)    | (5)                 | (6)    | (7)    | (8)     | (8)   |
| 1                  | 0           | 0          | —            | —      | —                   | —      | —      | —       | —     |
| 2                  | 1 0         | 1          | 1 0          | 1      | ∞                   | ∞      | 1 00   | 1 00    | —     |
| 3                  | 2 5         | 2          | 1 5          | 1      | 150 00              | 100 00 | 1 25   | 1 50    | 1 50  |
| 4                  | 5 0         | 3          | 2 5          | 1      | 100 00              | 50 00  | 1 66   | 2 50    | 2 00  |
| 5                  | 9 0         | 4          | 4 0          | 1      | 80 00               | 33 33  | 2 25   | 4 00    | 2 40  |
| 6                  | 15 0        | 5          | 6 0          | 1      | 66 66               | 25 00  | 3 00   | 6 00    | 3 66  |
| 7                  | 23 5        | 6          | 8 5          | 1      | 56 66               | 20 00  | 3 92   | 8 50    | 2 83  |
| 8                  | 33 0        | 7          | 11 5         | 1      | 48 94               | 16 66  | 5 00   | 11 50   | *2 80 |
| 9                  | 49 0        | 8          | 14 0         | 1      | 40 00               | 14 28  | 6 12   | 14 00   | 3 80  |
| 10                 | 65 0        | 9          | 16 0         | 1      | 32 64               | 12 50  | 7 22   | 16 00   | 3 61  |
| 11                 | 82 5        | 10         | 17 5         | 1      | 26 92               | 11 11  | 8 25   | 17 50   | 2 42  |
| 12                 | 101 0       | 11         | 18 5         | 1      | 22 42               | 10 00  | 9 22   | 18 50   | 2 24  |
| 13                 | 120 0       | 12         | 19 0         | 1      | 18 81               | 9 09   | 10 00  | 19 00   | 2 06  |
| 14                 | 139 0       | 13         | 19 0         | 1      | 15 88               | 8 33   | 10 70  | *19 00  | 1 90  |
| 15                 | 157 5       | 14         | 18 5         | 1      | 13 31               | 7 69   | 11 25  | 18 50   | 1 73  |
| 16                 | 175 0       | 15         | 17 5         | 1      | 11 11               | 7 14   | 11 66  | 17 50   | 1 55  |
| 17                 | 191 0       | 16         | 16 0         | 1      | 9 14                | 6 66   | 11 94  | 16 00   | 1 37  |
| 18                 | 205 0       | 17         | 14 0         | 1      | 7 33                | 6 15   | *12 06 | 14 00   | *1 16 |
| 19                 | 216 5       | 18         | 11 5         | 1      | 5 61                | 5 88   | *12 03 | 11 50   | *95   |
| 20                 | 225 0       | 19         | 8 5          | 1      | 4 39                | 5 35   | 11 84  | 8 50    | 79    |
| 21                 | 230 0       | 20         | 5 0          | 1      | 2 22                | 5 26   | 11 50  | 5 00    | 42    |
| 22                 | *231 5      | 21         | 1 5          | 1      | 63                  | 5 00   | 11 02  | 1 50    | 13    |
| 23                 | 229 0       | 22         | — 2 5        | 1      | — 1 08              | 4 76   | 10 41  | — 2 50  | — 2 1 |
| 24                 | 222 0       | 23         | — 7 0        | 1      | — 2 05              | 4 45   | 9 65   | — 7 00  | — 68  |
| 25                 | 210 0       | 24         | — 12 0       | 1      | — 5 40              | 4 35   | 8 79   | — 12 00 | — 124 |

the results of such experiments. The object of the table is simply to demonstrate the various ways in which the changes of product associated with the changes in a single factor may be described. It is, needless to say, assumed that no change in the quality or character of any factor takes place, such, for example, as a change in knowledge, skill, fertility of soil, etc.

The first method of envisaging the relationship between the changing quantity of factor  $a$  and product  $l$  is to produce a graph, such as that shown in Diagram Q. The total quantity of factor  $a$  at each stage of the experiment is measured along the horizontal axis and the total quantity of product  $l$  is measured along the vertical axis. In this case, the points representing the associated quantities of factor and product fall along a smooth curve, in an

actual experiment it is unlikely that they would fall in such exact order, but usually some "best fitting" curve can be produced. Such a curve is then seen to be the graphical representation of an equation. Again it must be emphasized that these figures are purely imaginary, but an equation is a conceivable possibility in all cases. Many experiments of this order have been conducted,

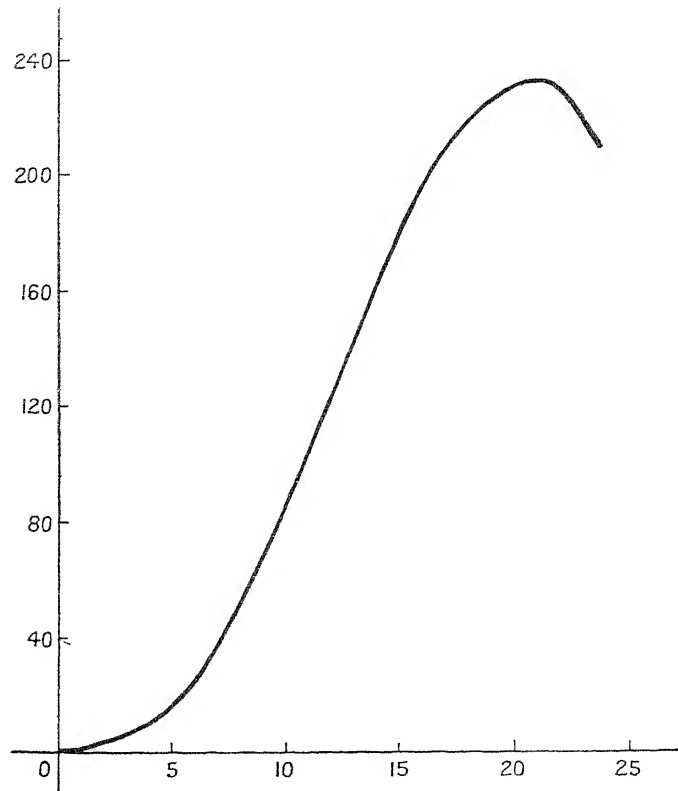


DIAGRAM Q

especially in agricultural work, and curves, with their equations, have been produced.

If an equation can be produced so that the product can be stated in terms of the factor [ $l = f(a)$ ] it is evidence of the rule of law, the rule of natural law or necessity. Many equations, as we have said above, have been produced in particular experiments, but the variety of patterns, within which men must of necessity

work, reveals a wide variety of equations, a special one, practically, for every situation.

An equation is what might be called the ideal mode of expressing the relationship between factor and product, but the variety of shapes of curves makes it impossible for any general "law" to be stated as, for example, the law of gravitational attraction can be stated by the physicist. Some writers aver that there is a general form of equation or curve which applies to all cases such as we are here considering, but there is no unanimity concerning the shape of such general expression. Some say that the curve in Diagram Q, at least as far as the highest point—the "ogee" or "S" shaped curve—is typical of all cases, while others assert that only the second part, showing convexity upwards is typical. We shall return to this matter later, but before doing so we must consider the significance of the shape of the curve for our immediate purpose, which is the examination of the *kinds* of change that may take place in the quantitative relationship of product to factor or output to input

The ratio between the total product and the total factor employed is the average product per unit of factor. As the quantity of factor employed increases, unit by unit, this average may increase, diminish, or remain constant. An examination of the table on page 139 (column 7) will show that in our imaginary case, the average increases as far as the seventeenth increment and, beyond this point, diminishes.

On the curve (Diagram Q) this point, at which the increase of average gives way to a decrease, is the point at which a line joining it to the origin of the axes makes a tangent to the curve. This shows that it really lies between the seventeenth and eighteenth increments. Similar lines drawn from other points on the curve, on either side of this tangential point, show falling ratios of output to input since their slopes diminish as the points selected travel further from the tangential point. Thus, by reading either the figures referred to in the table or the curve in the diagram, we can say that our imaginary case is one in which the average product per unit of factor increases to the seventeenth/eighteenth dose, remains constant at this point, and then diminishes. This situation is generally described as one in which we have a stage of "increasing returns" and a point of "constant returns", succeeded by a stage of "diminishing returns". Some writers prefer to describe the situation by saying that there is a point of maximum product per unit of factor (highest average product) and that successive increments or decrements, of factor employed, reduce this average or cause diminishing returns<sup>1</sup>

<sup>1</sup> Cannan, E., *Wealth*. Law of non-proportional returns, pp 67-71

It is easy to see why attention should be concentrated on the location of the point at which the highest average produce per unit of factor is obtained; it suggests that here the factor is most "effective". Such a conclusion should, however, be approached with care. All that can be said of this point is that it is just what it is, the point at which the highest *average* effectiveness is attained. This is not, however, the point at which effectiveness is at its maximum from all points of view.

An examination of the third column in the table will reveal the successive *increments of product* which result from the addition of successive *increments of factor*. These figures, which represent "increment productivity", show that the successive *increments* of the factor vary in their efficiency. From the first increment of factor to a point midway between the twelfth and thirteenth increments, the additions to product are successively greater, and beyond that point, they are progressively smaller. Thus, it is quite legitimate to say that the point of maximum efficiency of production is between the twelfth and thirteenth increments of factor. We can say that on either side of this point the increment productivity diminishes as we add or subtract successive units of the factor and this gives us an alternative mode of stating the conditions of increasing, constant, and diminishing returns.

In the curve in Diagram Q these same features are revealed by the increasing steepness of the curve (shown by the slopes of the tangents at successive points) up to a point between the twelfth and thirteenth increments and the diminishing steepness of the curve thereafter.

When successive equal amounts of a factor are added to a given pattern or scheme of factors the imputed average per unit of the factor may increase, remain constant, or diminish, and the imputed incremental (or marginal) production may also increase, remain constant, or diminish. Thus we may speak of a condition of increasing, constant, or diminishing *average* returns or increasing, constant, or diminishing *incremental* (or marginal) returns.

Though we may describe the changing ratio of product to factor in terms of average productivity or marginal productivity it is most important that the choice made on any particular occasion should be stated, since it is rare that the points of maximum incremental productivity and maximum average productivity coincide. The general situation in the table is a common one, and it is there seen that in this particular case the maximum *average* productivity is reached between the seventeenth and eighteenth increments (column 7) and the maximum *marginal* productivity is reached between the twelfth and thirteenth increments (column 8). As far as the

thirteenth increment both productivities increase and beyond the eighteenth increment both of them diminish, but between the thirteenth and eighteenth the marginal productivity falls and the average productivity rises (It is easily seen that the average productivity will always rise when the marginal productivity at any point is greater than the average, and fall when it is less; the average will remain constant when the marginal productivity and the average productivity are equal.) If the particular ratio is not stated it is, then, possible, that an organization may be described as being in a condition of increasing returns in terms of one ratio, when it is also in a condition of diminishing returns in terms of the other.

There is another mode of describing the "conditions of returns" which is often very convenient and, to mathematical students, is most usual, namely, that of relating the *rates of increase* of factor and product. In this case, increases of a factor are said to lead to increasing, constant, or diminishing returns when the product increases at a rate which is, respectively, greater than, equal to, or less than the rate of increase of the factor. When the ratio of these rates of increase is unity (between increments seventeen and eighteen in our illustrative table) we have the point of maximum average productivity, so this definition of returns conditions implies that the most "effective" use of a factor is that which gives the highest average product per unit. All these ratios, however, lie implicit in the same series of figures and their mathematical relationships are calculable: the choice made depends on the purpose for which it is employed. The most commonly employed conception is the "average" ratio.<sup>1</sup>

We now return to the question which we mentioned before, of whether or not the figures in our illustrative case can be regarded as typical of all cases in which a single factor is increased by successive equal increments, other things remaining equal. If so, though there may be no general mathematical *law* of returns, we may say there is a *general tendency* for average "returns ratios" to increase at first, reach a maximum, and then diminish.

There is no doubt at all that ultimately a point is reached in all such cases when the average return of product per unit of factor employed begins to diminish—that is, the tendency to diminishing returns in the later stages of the succession of increments is a universal rule. Regarding the returns in the earlier stages there would seem to be no rule: each case is a particular one. In chemical experiments (and, therefore, chemical manufacture) the addition of successive equal units of one chemical will yield,

<sup>1</sup> Edgeworth, F. Y. Papers relating to Political Economy, vol 1, pp 61-99 *The Laws of Increasing and Diminishing Returns*

at first, a constant ratio of the product and factor, but when the chemicals with which the added substance combines have all been "used up", further additions will give a zero increment of product and the average yield will, therefore, fall, the non-productive increments of factor being redundant. In other cases as, for example, when labourers are increased in numbers, there may be an increasing returns stage before "diminishing returns" sets in. By some writers it has been suggested that "diminishing returns" in agriculture begin from the first increment in all cases; it is claimed, for example, that the farmer, adding dose after dose of manure to his land, or pound after pound to his cattle feed, finds the increments of yield diminish from the start.<sup>1</sup>

Those who claim that the tendency to diminishing returns shows itself from the application of the first increment of the factor reconcile their claim with apparently contradictory evidence by suggesting that in these "exceptional" cases some other condition must be regarded as the cause.<sup>2</sup> This other condition is generally referred to as organization. Thus we are presented with the conception of the two "forces" at work, the one, due to nature (the tendency to diminishing returns), and the other, due to man, the tendency to increasing returns. It is claimed by these authorities that organization makes factors more effective without increasing their quantity or, alternatively, increases the quantity of their services.<sup>3</sup>

There is, here, a really important and difficult point to settle. For example, if we consider an increase of one worker by a manager employing many workers, are we to assume that he merely adds riveter to riveter or digger to digger and pays no attention to their organization? If he adopts the principle of division of labour we say that he "eliminates" waste labour. He does not eliminate waste labour really, he merely creates a new situation in which labour that was useful *before*, is *now*, if used in the old way, really waste. The additional worker not only adds his own labour but makes possible an increased effectiveness of other workers'.

<sup>1</sup> See Spillman and Lang, *Law of Diminishing Returns*, where it is suggested that the rate of decreasing returns is constant for any case but varies from case to case. See also Pigou, A. C., loc. cit., p. 704, where he notes similar ideas held by Carver, T. N., *The Distribution of Wealth*, pp. 65-6, and Wicksteed, P. H., *Common Sense of Political Economy*, bk. II, ch. v.

<sup>2</sup> Carver, T. N., *The Distribution of Wealth*, ch. II.

<sup>3</sup> "We say, broadly, that while the part which nature plays in production shows a tendency to diminishing return, the part which man plays shows a tendency to increasing return. The law of increasing return may be worded thus: An increase of capital and labour leads generally to an improved organization, which increases the efficiency of the work of capital and labour"—(Marshall, A., *Principles*, pp. 318-19.

work Merely to add another labourer and make no change in the organization is, however, to destroy the additional worker <sup>1</sup>

If the manager of the factory changes his organization, can we say that our increment of labour is added to a given pattern of production or to a fixed group of other factors? Can we say that other things are equal?

In one sense we assuredly can say that, if he alters his organization, other things are not equal. If, however, we say that by other things being equal we mean that the *quantities* of other factors have not been altered, though their *modes* of use have been altered, we can say that the increment of factor has been added to a given pattern or fixed group of other factors, the factors being "given" or "fixed" in quantity. This enables us to "allow" the organizational adjustments. The increment of product which the new organization gives is, then, the imputed product of the increment of factor

After all, we are concerned with the relationship of product and factor in a given organization, with the effect on the productivity of an organization, of a variation in the quantity of a certain factor. To speak of the "economies of organization" is really tautologous: organization is the making of a best pattern. If any addition of a factor is made, the organization to which it is added is not an organization until the reorganization rendered necessary by the additional factor is effected. Some economists speak of organization as a "factor" of production, as if it can be applied in "doses", but it is not a thing that can be measured: it cannot be considered quantitatively. An organization may be good or bad, but it cannot be more or less. There may be more or fewer "organizers", there may be much or little organizing activity but there cannot be too much or too little organization, it simply is. Thus we come to the conclusion that, when a unit of a factor (or a succession of units of a factor) is added to an organization, its productivity must be reckoned as the addition to the organization's productivity when the organizational adjustments have been made; the only qualification that must be made is that the organizational adjustments do not involve any additions of other factors, for, if they do, then the increment of product is attributable to multiple factors and no ratio between product and multiple factors is possible

Thus, from this, it would seem to follow that, if some cases are discoverable in which the addition of a unit of a factor causes

<sup>1</sup> Strictly speaking it is impossible to add one worker to another without altering the organization, because it is impossible to put two workers where one is, and if they are not put in the same place the organization or pattern is altered in other ways than by simple change of quantity

increasing returns to operate, it is not possible to explain away the increase by attributing it to organization. The observed fact must be taken as it stands and the universal operation of diminishing returns from the first dose onwards must be denied. The statement with regard to the returns on a variable factor must run as follows :—

*When equal successive units of a factor are added to a given pattern of resources, a point is reached beyond which average returns per unit of factor diminish. Before this point is reached the average returns may remain constant or increase, or the point may be the initial point.*

It has doubtless been observed that this discussion of the change of relationship between the quantity of product and the quantity of a single factor, when all other factors remain stationary, is, in reality, a discussion on general lines of the situation which, in the cultivation of land, is known as extensive farming. A farmer employs more extensive methods of cultivation when he extends the acreage of land which he cultivates. True it is that in such cases he always alters the organization of his other factors, but with that we have already dealt; the characteristic of extensive farming is extensive acreage. Up to a point, a farmer who enlarges the area of his farm, with other given resources, may be able to increase his product at a greater rate, but, beyond this point, he will pass into the stage of diminishing returns. Strictly speaking, intensive farming should be regarded as the negative to this, a farmer employs intensive methods when, other factors remaining constant in quantity, he reduces his acreage. It is common to think of an increase in the intensity of farming as an increase in the quantity of resources applied to a given unit of land, but since it is impossible to conceive of a unit of different factors in combination from the physical point of view, it is better to think of intensive and extensive farming as the application of less or more land to a given group of factors. If we regard factor *a* (in the illustrative table) as land, we have a series of conceivable figures, the units of *a* which are added being roods or acres or any other real unit. If we move "up" the columns and note the changes in productivity we are noting the effects of intensive farming; if we move "down" we are noting the effects of extensive farming. What is said here of land applies with equal force to all other factors. If the quantity of labour, or seed, or manure, or any other single factor employed is increased, we may say that it is used more extensively, if it is reduced, it is used more



intensively; so we may state our proposition with regard to returns in yet another way —

*When a factor is used more extensively in any given organization it may lead to increasing, constant, or diminishing average returns, and the same is true if the factor is used more intensively (or less extensively).*

A particular case of the application of this conception is that of the relation between population and a given territory. Assuming the quality of the people to remain unchanged, it would seem reasonable to assert that an increase of population (a more extensive employment of people) leads to an increasing, constant, or diminishing average returns possibility with regard to some particular product, say wheat, and that there is a number which can produce the maximum average returns of wheat per capita.

Economists have suggested that the statement may be extended in its application and made to include all products, so we are told that there is, at any moment, a certain population that could yield a maximum average product of "things" in general and this population has been termed the "optimum". There is a certain ring of plausibility in this, but it is difficult to allow to pass a statement concerning an inconceivable total or average quantity. From the physical point of view there is no method of calculating an average production of all commodities of different kinds.<sup>1</sup>

Having discussed the conditions of increasing, constant and diminishing physical returns with respect to a single factor and a single product, and having shown that we cannot discuss these conditions with respect to multiple factors, we must now consider the conditions of maximum total production of a single product. We said that we might regard maximum average and maximum marginal productivities as two points of maximum productive effectiveness; in another sense we might regard an organization which produces a maximum possible total also as an organization working at maximum effectiveness. With the significance of "effectiveness" we shall deal later.

In the first place, we can easily state the condition that determines the maximum production in a given organization when a single factor is variable. The illustrative table on page 139 shows this position quite clearly. The factor *a* is the variable and the maximum product is there recorded as 231·5 units, when 21 units of the factor have been applied. In reality, the maximum is reached

<sup>1</sup> Keynes, J. M., *Economic Consequences of the Peace*, ch. ii. Cannan, E., *Wealth*, ch. iv. Beveridge, Sir W., "Population and Unemployment," Presidential Address, Sect. F., Brit. Assoc. 1923.

a little later, between the twenty-first and twenty-second "doses" as a reference to the curve (Diagram R) will show; at this intermediate point the marginal productivity of this factor is zero. In the table, the twenty-first unit gives an increment of product of 1.5 units and the twenty-second "dose" gives a decrement of product of 2.5 units, but if the doses were made much smaller it would be found that the maximum was attained between these points at the maximum, the marginal increment of product is, obviously, nil

Now there is another way of regarding this situation. When factor  $a$  is applied in varying quantities to a given group of factors it is quite legitimate to impute the product to this factor, but it is equally legitimate to impute it to the organization itself to which  $a$  is added. In this case we may say that when between twenty-one and twenty-two doses of the variable factor  $a$  have been added a maximum has been reached which is the maximum which the group of factors other than  $a$  will yield to this variable. In other words, 231.5 units of product, in this example, measures the maximum or *full use* that  $a$  can make of the given circumstances.

The question now arises: What is the condition of a maximum when *two* or more factors are variable and the remainder are fixed? And ultimately the questions arise: What is the condition of a maximum when *all but one* of the factors are variable? and What is the condition when *all* are variable? We must deal with these questions in order.

A simple case will illustrate the position to be considered in answering the first question. The crop yield of a given piece of land varies with the amount of water and the amount of manure applied. If to the land with a given amount of manure successive doses of water are applied, the maximum crop will be obtained when the marginal product is zero. If, to the land with a given quantity of water applied, successive doses of manure are added, the maximum quantity of product will be similarly determined, at the point where the marginal productivity of manure is zero. But the water and manure may affect each other and, with different quantities of water, the productivity of successive doses of manure will vary differently, while, with different quantities of manure, the productivity of water will vary differently. There is no method of calculating the products of all possible combinations of these two factors. Farmers may keep records and they may be useful guides, but they must still employ what is commonly known as judgment, a power given by experience only. When the maximum is reached the marginal productivity of each variable factor will be zero, but the data obtained by a single variation scheme of each

factor with a given quantity of the other will not be sufficient to enable calculations of the conditions of a maximum to be made.

The answer to the second question is similar. When all factors are variable but one, the condition of the maximum product will be that the marginal productivities of all are zero; the single fixed factor will then be fully used. There is no means of calculating this except by collecting data which will give the result without calculation, it is a matter of experience again. One observation can, however, be made, namely, that when one or more factors are fixed there is a maximum quantity of any particular product that can be obtained therefrom. There may be several combinations which will give the maximum, but there is only one maximum.

The mathematical relationship between the product and a group of variable factors (when one or more are fixed) is, in all cases, extremely complicated. In the case of a single variable factor it is sufficient to say that the product varies in some particular way with this factor or, as mathematicians say, the product is a function of the factor, but in the case of a group of factors the product is a function of each factor and the productivity of each factor is a function of each other factor. Every change in the pattern effected by the variation of one factor alters the circumstances in which every other factor operates.

There now remains for consideration the third question, whether or not there is a maximum production possible when all factors are variable in quantity and, if there is, then what are the conditions? This is a case which arises frequently—the discussion of the problem of “large scale organization”.

It will help if we recall the last case discussed. There we considered the condition of a maximum yield from a given factor when all others are variable. We noted that the condition was that the marginal productivities of all the variable factors were zero.

When a given quantity of a factor yields its maximum we say that it is “fully used”. In our last case we discussed the condition of *the full use of the fixed factor*, so we may express the position in this way —

A factor is fully used when the marginal productivities of the other factors with which it is combined are all equal to zero.

It must be carefully observed that this does *not* mean that the “other factors” whose marginal productivities are zero are “fully used”; it means that when their marginal productivities are zero they are producing as much as possible *out of the fixed factor*. They are working to their maximum effect in these circumstances but if the fixed factor is replaced by a variable factor, it is possible that

they might do more. It is clear, however, that in the case of an organization, all of whose factors are variable *ad libitum*, the maximum production possible implies that all factors are fully used and that all, therefore, are present in such quantities that their marginal productivities are zero.

Having defined the condition of maximum production when all factors are variable, we are still left with our unanswered question: Is there a possible or necessary maximum output of an organization, or can an organization increase its output *ad infinitum*? Assuming that means are obtainable *ad libitum*, it will be apparent that if there is, of necessity, a maximum beyond which the organization cannot go the reason must lie in what we may regard as the internal relationships of the factors in the organization.

We have seen that when a single factor is fixed there is a maximum production attainable and that when this maximum is attained this single factor is fully used. If there is a maximum when all factors are variable it follows that, of necessity, there are, for any particular product, certain quantities of all factors that can be fully used in combination, and, if an attempt is made to extend these quantities, then the organization as a whole yields a smaller output. If more product is required, another organization unit must be established.

Again, we can put this inquiry in a less abstract form. If a production unit can increase its output indefinitely it implies the possibility of indefinite specialization in the employments of men and materials, the never ending possibility of utilizing "waste" or non-effective resources. In short, it means that a position is never reached when all factors are fully employed. A consideration of a real production unit will make the position clear.

Everybody is familiar with the "moving belt" method of producing cars. Leading up to the belt at various points are the streams of "parts" required for assembly on the belt. These parts are, in their turn, produced on similar principles, so that the whole concern can be regarded as a system of tributary streams, tributaries running into larger tributaries and all flowing into the main stream. Can such an organization grow indefinitely large or are there physical limitations that put a check on its growth?

It would seem that such a question needs only to be formulated. There are limits to the strength of men, there are space limits, there are limits to the sizes of machines and belts. It is well recognized that there is a limit to the output that can be obtained, technically, from a single factory or mill. "Too many cooks spoil the broth," and men and machines would either interfere with one another or there would be so much "waste" of transportation that the

resources could be employed in smaller units to produce larger products.

Generally, when economists discuss this matter, they fall back upon the limited capacity of man to organize as an ultimate limiting condition of the growth of the output of an organization. As the output increases there is inevitably an increasing number of workers to supervise and co-ordinate in their operations. Both supervision and co-ordination occupy an organizer's time and energy and in so far as supervision affects discipline and discipline affects the quality of work, and in so far as the co-ordination necessary involves attention to many details and frequent readjustments, it is clear that in both respects difficulties increase as the scale of output increases. Producing units vary in the significance that attaches to these two duties of organizers : some workers find their work sufficiently interesting, say, to work their best, whether observed or not by the supervisor, while others do not, some organizations require far more detailed co-ordination than others because, for instance, the employment of centrally controlled machinery is not so extensive. In farming the function of co-ordination is extremely difficult, because of the frequent rearrangements that the changes of weather impose on the occupations of the farm workers and because of the factor of extensive space in a business that works the land

It is fairly obvious that individuals vary in their organizing capacities - some can deal with a far larger volume of activity than others. There is a limit, however, to the capacity of even the best, and the business of organizing has itself been organized to make possible the proper supervision and co-ordination of the units producing with multifarious units of factors. Systems of management such as directorates with line and staff, or divisional allocations of function have made possible the control of larger units, but, at any given point of time, there seems no reason to believe that the output of a single organization can be increased indefinitely. The maximum use of all the factors in a group when all are variable in quantity can be obtained from an organization of finite dimensions. New knowledge may change the possible dimensions but it cannot overcome this necessity altogether.

So far as we have proceeded with our examination of the relations between physical resources employed and physical product obtained in a single organization, we have arrived at the following conclusions :—

1. Beyond a certain point, in every organization in which all factors but one are fixed, the effect on the average product

per unit of successive equal increments of the variable factor is to diminish it. Before that point, the average may increase or remain constant.

This phenomenon may be stated alternatively as follows:—

In every organization in which all factors but one are fixed, the rate of increase of the product brought about by increasing the quantity of the variable factor, is, beyond a certain point, less than the rate of increase of the factor.

2. The tendencies to increasing, constant and diminishing physical returns can only be stated with respect to a single factor and a single product, all other factors being fixed

3. In every organization in which one (or more) factor is fixed there is a maximum amount of a particular product which can be raised

4. In every organization, a maximum quantity of any single product is attainable, even if all factors are variable in quantity <sup>1</sup>

It will be observed that throughout this discussion we have assumed that variable factors could be varied to any extent without any let or hindrance; the organizer has been assumed to have absolute freedom to vary quantities and proportions of his physical resources. We must now drop this assumption and consider the case in which the addition of a unit of a particular factor can only be effected by the reduction of some other factor or factors. This is the universal position in which people find themselves when administering their resources.

If a person can only increase the quantity of one factor employed by reducing the quantity of another factor in use, we may say that, in a sense, he is working within a condition of general limitation of means. We cannot say that he is working with a fixed quantity of means because, as we have repeatedly pointed out, we cannot speak of a measurable quantity of various kinds of resources; at the same time, the limitation is of that character. The only way in which a

<sup>1</sup> See Robinson, E. A. G., *The Structure of Competitive Industry*, esp. chs. II, III, IX, and X, dealing with the *Optimum Firm* including the *Optimum Technical Unit*, the *Optimum Managerial Unit* and the *Location of Industrial Units*.

Obviously in a discussion of physical conditions we are concerned with the technical unit; we cannot deal with an *optimum* technical unit because there is no such thing according to our use of terms. Mr. Robinson defines his optimum firm as "that which produces at lowest average cost", but *technically* cost cannot be measured. What Mr. Robinson is concerned with, however, is the influence of technical conditions on the production of goods, in a market which has *values*. What he says in these chapters is very relevant to the matter under consideration here and is very valuable. We, however, direct attention to *maximum*, not optimum. We have considerable sympathy with his observation (p. 53) that "to discuss the optimum managerial unit of thirty years hence is the task not of an economist but of a prophet."

See also Marshall, A., *Industry and Trade*, esp. Bk. II.

person so limited can vary the amount of his produce is by varying the proportions in which he employs the factors, and this process is the process of *substitution*. The matter we must now consider, then, is the condition of maximum production when the only means of varying production is by substitution.

If when a certain quantity of one factor is removed the product is affected, but when a certain quantity of another factor is substituted for it the product is brought back to its original magnitude so that the effect of the substitution is nil, it is clear that we may speak of these quantities of the two factors as exact substitutes for each other. Thus if, in a scheme of production, 2 units of factor A and 3 units of factor B produce the same result as 1 unit of factor A and 5 units of factor B it follows that 1 unit of A and 2 units of B are exact substitutes in the sense that the loss of product by the removal of one unit of A can be made good by the addition of two units of B.

Assuming that the objective of an organizer is the production of the maximum quantity of a certain commodity, it follows that, if he can make a substitution that will increase his product, he will do so; if a possible substitution will reduce his product he will not make it and if it will have no effect it is a matter of indifference whether he makes it or not. Therefore, in considering the extent to which a person, aiming at a maximum physical product, will substitute one factor for another, there are two matters that we must bear in mind; (a) the substitution which he *can* make and (b) the relative productivities of the substitutable quantities of the different factors. We can explain more clearly by using an illustration.

A person cultivating his garden may, on a certain day, decide that the garden requires a good deal of watering and a good deal of manuring, but since he has to do all the work and his time is limited he cannot give the garden as much water and as much manure as he would like, so he has to make the best of his circumstances. If he spends the whole time watering he knows how much water he will be able to distribute, and if he spends the whole time manuring he knows how much manure he will distribute, he also knows the effect of each on the garden produce. Knowing his rate of manuring and his rate of watering he can calculate the substitution quantities possible, an hour of his time means  $x$  units of manure applied or  $y$  units of water; two hours means another pair of substitutable quantities and so on. Let us suppose that he decides that the maximum result is attained by giving three hours to manuring and five to watering; what is the condition that determines this ratio?

Diagram R will elucidate the situation ; it is drawn in three dimensions. The horizontal axes measure the time given to each process on the assumption that what is not spent on one of them, out of the eight available hours, is spent on the other. The broken line (AB) joining the points, eight hours on watering and eight hours on manuring, represents the possible combinations of processes. The vertical scale measures the amount of product and, therefore, the curve CMD shows the variation in product that takes place with the variation in allocation of time MT denotes the maximum product and its base T is located at three hours manuring, five hours watering

The line ATB may be called the " possible factor combination

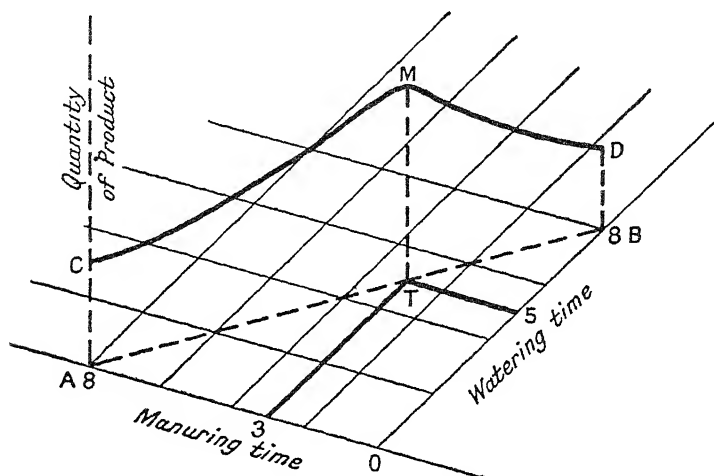


DIAGRAM R

line". As we move from A to B we are continuously replacing manuring with watering. From A to T this substitution process increases the total product : as we pass on to B beyond T it causes a reduction of product. At the point T the substitution quantities are equal in productivity. From A to T the ratio of the productivities of the substitute quantities is greater than unity and beyond T it is smaller than unity. When the ratio of substitute productivities of watering and manuring is *less* than unity the ratio of " substitute productivities of manuring and watering is *greater* than unity ; therefore, it follows that between A and T the tendency is towards the substitution of watering for manuring and between T and B towards the substitution of manuring for watering.

Diagram R shows the substitution of manuring *time* and watering



time. Diagram S shows the substitution of *manure* and *water*. The curve OP shows the variations in the quantity of water that can be distributed in various periods from 0 to 8 hours: the quantity of water is measured on axis OB and the quantity of time on axis OS. The curve OL shows the variations in the quantity of manure that can be distributed in lengths of time varying from 0 to 8 hours: the quantity of manure is measured along the axis OA and the length of time along OV. The projections of points along OP on to the axis OB show the amounts of water than can be distributed in hour units of time and the projections of points along OL on to the axis OA show the amounts of manure that can be distributed in hour periods. The line ATB is then the curve of "possible factor combination" plotted in terms

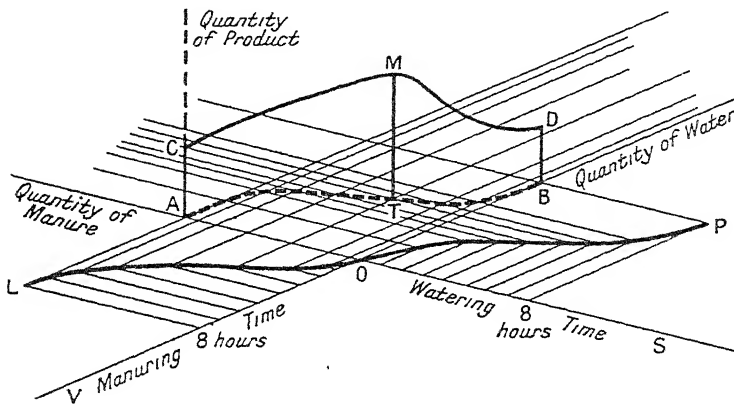


DIAGRAM S

of quantities of water and manure by taking 1 hour's manure with 7 hours of water, 2 hours of manure with 6 hours water and so on. The line CMD shows the variation in product with the variation in the quantities combined. TM is the maximum product effected by combination of that quantity of manure distributed in 3 hours with that of water distributed in 5 hours. At the maximum in this case there is an equality of production between the *marginal substitute quantities* of manure and water.

Diagram R shows that the maximum is reached when the productivity of the marginal unit of time spent in manuring equals the productivity of the same unit in watering. Diagram S shows that the condition of the maximum is that the pounds (weight) of manure spread in the final unit of manuring time equals in productivity the gallons of water distributed in this same unit of time.

It should be noted that the productivities of the "*substitutable quantities*" of water and manure employed in the "*marginal substitution adjustment*" are not *marginal productivities*. The marginal productivity of a factor is the productivity of an infinitesimally small increase or decrease of this factor but the productivities we are here considering are those of "*substitutable quantities*". It is possible, however, to show the relationship between the "*ratio of marginal substitute productivities*" and the ratio of "*marginal productivities*" and it can be shown by the use of simple illustrative figures.

Let us suppose that the marginal transference of time from watering to manuring or from manuring to watering to result in the application of  $x$  units more or less of water and  $y$  units less or more of manure; then it follows that, when this marginal transference results in no change of product, i.e. the production is at the maximum, the productivity of the  $x$  units of water equals the productivity of the  $y$  units of manure. Let this productivity be  $d$  units

If  $x$  units of water produce  $d$  units of product, it follows that one unit of water produces, on the average,  $d/x$  units of product, but if the size of each of the  $x$  units be infinitesimally small then  $d/x$  also equals the productivity of the final unit or the *marginal productivity of water*. The same reasoning may be applied to show that the *marginal productivity* of manure is  $d/y$ . From this it follows that the ratio of the marginal productivities of water and manure is  $y/x$  (equals  $d/x \div d/y$ ), and this is the result we require to show the relationship between *marginal productivities* and *marginal substitute productivities* when the maximum product is desired. It will be observed that  $y/x$  is the ratio of the quantity of manure and the quantity of water which are exactly substitutable for each other at the margin.

The ratio in which water and manure *can* be substituted for each other has no dependence upon productivity. It depends simply upon the physical possibilities of the gardener; in a certain time he can spread so much manure or so much water and the quantities are determined by such things as personal strength, distance from the pump and farmyard. The amount of substitution *actually made* does depend, however, upon their productivities.

If the increase of water by a certain number of units involves the curtailment of manure by a certain number of units, we may be allowed to call the ratio of the quantities a *substitution price* and the amount of curtailment a *substitution cost*. It follows, then, that if we say that at the margin of adjustment  $x$  infinitesimally small extra units of water can be employed at a cost of  $y$  infinitesimally

small units of manure then  $y/x$  is the *marginal substitution price of water* and  $x/y$  is the *marginal substitution price of manure*<sup>1</sup>

Our conclusion from the last paragraph may be stated as .—

$$\frac{\text{Marginal productivity of water}}{\text{Marginal productivity of manure}} = \frac{\text{Marginal substitute quantity of manure}}{\text{Marginal substitute quantity of water}} \\ = \text{Marginal substitution price of water (in terms of manure)}$$

or,

$$\frac{\text{Marginal productivity of manure}}{\text{Marginal productivity of water}} = \frac{\text{Marginal substitute quantity of water}}{\text{Marginal substitute quantity of manure}} \\ = \text{Marginal substitution price of manure (in terms of water)}$$

In other words, the relationship may be expressed thus: *The ratio of the marginal productivities of two factors A and B is the inverse of the ratio of the least quantities of them which can be substituted for each other when the total product is a maximum and the quantities that are substituted are very small*

It will be seen that what applies to water and manure must apply to any pair of factors in a group. When a group of factors is so arranged that the product is a maximum, then the ratio of the marginal productivities of any pair A and B is equal to the *marginal substitution price* of A in terms of B. This may be demonstrated by reference to Diagram T.

In Diagram T the four radiating lines represent four factors A, B, C and D. It is assumed that they are employed in such proportions that their joint production is a maximum. Further, it is assumed that the smallest number of infinitesimally small units of each that can be substituted for the others is 6 of A, 5 of B, 1 of C, and 3 of D. It follows from this that each "marginal substitution price" can be calculated in terms of each other factor and this price is the ratio of the marginal productivities of the corresponding factors.

If the marginal productivity of A is reckoned as unity then the marginal productivity of B is equal to 6/5 of unity, i.e. 1.2 since the

<sup>1</sup> Or, more shortly and in accordance with general usage, *marginal price of water, in terms of manure* and *marginal price of manure in terms of water*. For *marginal substitute quantity of manure*, given below, we may put *marginal purchase (or sale) of manure by (or for) water*, and *marginal purchase (or sale) of water by (or for) manure*. We insert the term "substitute" to emphasize the fact that we are conducting a substitution process, also, at this stage, we are dealing with *physical* conditions, and "price", "purchase," and "sale" are usually associated with the market.

We might use the phrase "marginal possible rate of substitution". Care would need to be exercised in distinguishing this from Dr Hicks's "marginal rate of substitution", which he defines as "the quantity of good  $y$  which would just compensate him for the loss of a marginal unit of  $x$ " ("A Reconsideration of the Theory of Value," *Economica*, 1934, p. 55). When the maximum product is attained the "rate of marginal possible substitution" and the "rate of marginal substitution" are equal. See below, p. 163, where we call the "line of possible substitution" the "path of possibility".

marginal productivity of A is  $\frac{5}{6}$  of the marginal productivity of B. In like manner the marginal productivity of C is 1.5 and of D is  $\frac{6}{3}$  or 2.0. Thus the marginal productivities of A, B, C and D are 1, 1.2, 1.5 and 2.0 respectively.

It will be recalled, however, that the name of "*marginal substitution price*" was given to the ratio of the quantities of two factors that could be "marginally" substituted for each other.

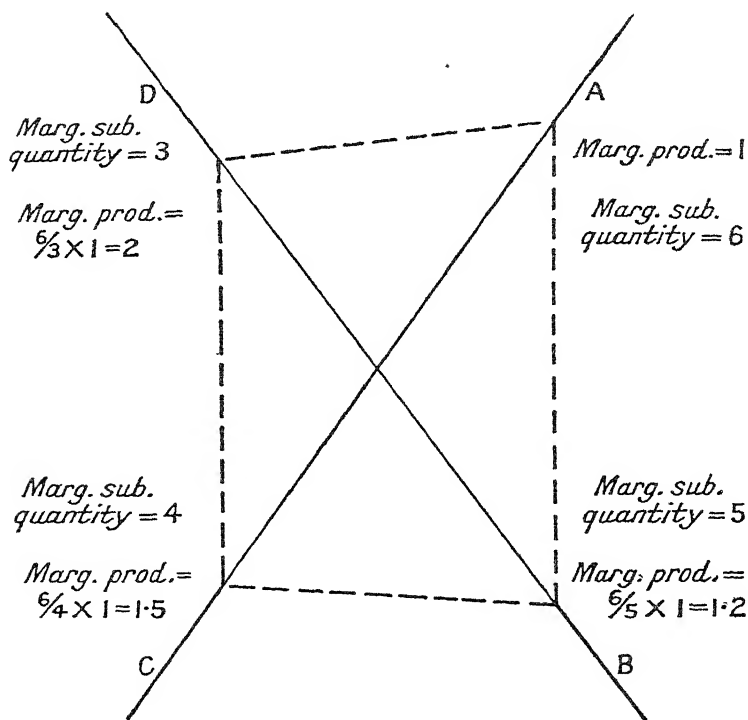


DIAGRAM T

Thus, taking the marginal substitution price of A in terms of A as unity, the marginal substitution prices of the other factors are  $\frac{6}{3}$ ,  $\frac{6}{4}$ , and  $\frac{6}{5}$  respectively, that is 1.2, 1.5, and 2.0. The ratios of the *marginal productivities* of substitutable factors are then equal to the *marginal substitution prices* of those factors.<sup>1</sup>

We may gather together all the figures which we have employed

<sup>1</sup> In the market this is the well-known principle that the ratios of marginal productivities and the ratios of money prices are equal, in equilibrium, when infinitesimal adjustments can be made.

in this second illustration and tabulate them so that all the relationships we have noted may appear more clearly.

|    | <i>Marginal<br/>substitutable<br/>quantities</i> | <i>Marginal<br/>substitute<br/>productivities</i> | <i>Marginal<br/>productivities.</i> | <i>Marginal<br/>substitute prices<br/>(in terms of A).</i> |
|----|--|---|-------------------------------------|--|
| A. | 6  | 6   | 1.0                                 | $6/6 = 1.0$  |
| B. | 5  | 6   | 1.2                                 | $6/5 = 1.2$  |
| C  | 4  | 6   | 1.5                                 | $6/4 = 1.5$  |
| D  | 3  | 6   | 2.0                                 | $6/3 = 2.0$  |

(" Marginal substitute quantities " are the smallest numbers of infinitesimally small units that can be substituted for one another in any given scheme " Marginal productivity " is the productivity of an infinitesimally small increase or decrease of a factor " Marginal substitution productivity " is the productivity of a " marginal substitute quantity " " Marginal substitute price " is the ratio between two " marginal substitute quantities ")

Returning for a moment to the gardening illustration, it will be recalled that the two allocations of time (labour) gave equal marginal productivities but the two substitute factors did *not* give equal marginal productivities. Our study of substitution has, therefore, revealed two kinds of substitution that we must make clear in our minds : there is the substitution of water for manure and there is the substitution of one use of labour for another use of labour. In the first kind of substitution we replace one factor by another and in the second kind of substitution we distribute one factor between two uses. It will be observed that our second illustration was an example of the first type of substitution in which four different factors could be substituted for one another.

These two types of substitution then, make it possible to enunciate two principles of administration of physical resources :—

1. When a given quantity of any factor is applied in several ways towards the attainment of a maximum quantity of a single product, the marginal product of that which is applied in one direction equals the marginal products of those quantities which are applied in other directions.<sup>1</sup>

2. When a group of different factors is capable of variation in relative quantities employed, but the variation in one factor can only be obtained by a variation in some other factor, then the condition of a maximum product is that the " marginal substitute productivities " are equal and this implies that the marginal productivities of the different factors are identical in relative magnitude with their " marginal substitution prices " when referred to one factor, infinitesimally small adjustments being assumed possible.<sup>2</sup>

<sup>1</sup> Marshall, A., *Principles*, III, ch. v, §1 (The primitive housewife and her hanks of wool to be made into socks and vests)

<sup>2</sup> See Hicks's *Theory of Wages*

The first of these principles is usually known as the "principle of equi-marginal returns" and it is regarded as a principle of prime importance. An examination of both of them will, however, show that, in reality, this first principle is but a special case of the second. If the allocation of time to working with manure is regarded as the employment of a factor separate from the time spent working with water it will be seen that the "marginal substitution price" of labour-time given to manuring is, in terms of the labour time given to watering, unity, and this means that their marginal productivities have a ratio of unity. Thus, the basic principle of administration of factors, whose relative quantities and employments are continuously variable, is that maximum production is attained when the marginal productivities of factors are proportional to their "marginal substitution prices" and it applies equally to the allocation of a single factor to several uses and to different factors whose proportions can be varied, so long as the product is a single product.

Now the circumstance which imposed the necessity for substitution, as a means of our gardener's producing his maximum, was the limitation of resource-time units which we described as the given amount of time. From this we worked out our conception of the physical substitution ratio which we called the "substitution price". It is clear, however, that substitution prices need not be imposed through this particular limitation at all. They may, instead, be market prices and the limitation within which the organizer may work may be the limitation of the money's worth of all the factors which he possesses. We are not dealing with the financial aspect of internal administration in this chapter but it is within our competence to consider the conditions of a physical maximum production within a given price scheme when a person's financial resources are given.

There is no new circumstance introduced. When the maximum product is attained the same relationships that we noted in our gardening case are seen to exist. In the first place, it is easy to conceive of the marginal substitution prices of the various factors; they will each be the smallest conceivable unit of money divided by the number of units of each factor which it will buy. The factors will be bought in such relative quantities that their marginal productivities are proportional to these marginal substitution prices or, simply, marginal prices. Alternatively, the condition may be stated as being such that the marginal productivity of money in every direction is equal to the marginal productivity of money in every other direction<sup>1</sup>.

<sup>1</sup> Marshall, A., *op cit.*, pp. 118-19.

The latter part of our discussion has been a study of the process of substitution. We have shown that in the pursuit of a maximum product where substitution alone is the mode of changing the product, the tendency is to organize to such a point that marginal substitution prices and marginal productivity ratios are equal. It follows from this that whenever the marginal productivity ratio of two factors is greater than the substitution price of the factor to be increased, then substitution will take place. It also follows that if, for any reason such as change of technique or change of market prices, the scheme of substitution prices changes, then the combination of factors that will give the maximum product will also change. The change will show itself in the different proportions employed so that, in the new scheme, marginal productivity ratios and the new substitution prices will be equal.

The change in the relative amounts of factors which takes place on account of a change in the substitution prices of the factors may be regarded quantitatively as an *amount of substitution*. It is not difficult to see, then, that if this change of proportions or amount of substitution can be related to a change in the prices at which the factors may be obtained, a measure of *elasticity of substitution* is obtainable. This is a new conception which has been introduced into economics since the basic importance of the conception of substitution has been fully appreciated.

As a formula the elasticity of substitution may be expressed as the ratio between the fractional change of the proportions in which factors are employed and the fractional change in the ratios of their prices:—

$$\frac{\text{Change of proportions of factors employed}}{\text{original proportions}} = \frac{\text{New proportions of factors employed—old proportions}}{\text{old proportions}}$$

$$\frac{\text{Change of substitution prices}}{\text{Original substitution prices}} = \frac{\text{New substitution price ratios—old substitution price ratios}}{\text{Old substitution prices}}$$

This is a very important conception as it gives a quantitative notion of the substitutability of factors. Some factors cannot be substituted for each other or, in other words, if their prices change relatively, their relative quantities employed cannot be altered. At the other extreme are factors which can be completely substituted for each other if their relative prices change slightly. But between these extremes of zero and infinite elasticity are multitudinous cases in which a certain amount of change will be made if possible substitution ratios or prices change. Much will have to be said of this conception in subsequent chapters but sufficient has been

There is an alternative mode of presenting the process of



Let A and B be two resources employed in the production of a



commodity and let us assume that varying quantities of these resources produce varying quantities of the commodity. Let an administrator possess OX of the resource B and let it be possible for him to acquire (by exchange or direct production) quantities of the resource A in such proportions that the line XY gives all the possible combinations of A and B which he can make. We will assume that XY is a straight line: the slope of this line, scale considered, gives the ratio at which he can substitute A for any given amount of B.

Assuming that there is one combination of A and B which will give the maximum production of the commodity we can indicate this particular combination by the point P, the combination being Oy of A and Ox of B. Since the point P is the point of maximum production it follows that, as our administrator traverses the line XY he passes from points of low productivity, through the point of highest productivity and down again to lower productivity, towards Y. We may consider him, metaphorically, as traversing a line over a "hill of productivity".

We will pursue this metaphor and imagine a "hill of productivity"<sup>1</sup> with "contour lines" as shown in the diagram. These contour lines, in our case, indicate points of equal productivity. If we travel along one of them we keep productivity constant but vary the proportions of A and B employed. They represent factor combinations of equal productive efficiency and we may call them *iso-productivity curves*. (They are generally known as "indifference curves" because there is no choice to be made amongst the combinations represented by the points of any one curve since they are all equally effective.)

Now, if we allow the possible existence of these curves (of equal technical possibilities) it is clear that, as our administrator travels along XY in search of his maximum production he will find it (assuming the higher iso-productivity curves or "contours" to be found in direction H) where his line XY is tangential to one of the iso-productivity lines. At point P this is shown. The maximum production point may then be said to be where the line of possible substitution is tangential to an iso-productivity curve or indifference curve, or where the "path of possibility" reaches the highest "contour" on the "hill of productivity".

From this there follows an important conclusion. The line XY in the diagram expresses two facts: (a) it expresses the ratios of possible substitution and (b) it expresses, at the point P, the ratio of substitution which makes no difference to the production. At

<sup>1</sup> Pareto, V, *Manuel d'Économie politique*. Corresponding to "hills of pleasure".

point P, then, the ratio of possible substitution is equal to the ratio of substitution which makes no difference to the total product.

As the tangent to the iso-productivity curve, the slope of the line XY shows the ratio of the *marginal substitute quantities of equal productivity*<sup>1</sup> As the line of possible substitutions it indicates, at point P, that the *marginal possible substitution price of X in terms of Y is the inverse of the ratio of the marginal productivities of X and Y respectively.*

The diagram shows further that the ratio of substitution along the iso-productivity curve increases in both directions away from P; if Y is substituted for X, more Y per unit of X must be forthcoming, and if X is substituted for Y, more X per unit must be forthcoming. This is a necessary condition of P's being the point of maximum production. The line XY, however, being the line along which substitution must take place it follows that the condition of maximum physical production is that the *productivity of successive quantities of either resource substituted for the other is less than the productivity of that for which it is substituted.*

From this analysis we may now proceed to consider the effects of a change in the possible substitution ratio denoted by the line XY. (This may be due to a change of market price or a change of "technical efficiency" of one or other factor.) If we assume our administrator to be possessed still of OX of B but let the substitution ratios be represented by Y'X instead of YX, it will be obvious that the point of tangency with an iso-productivity curve will be elsewhere than at P. If the possible substitution ratio of Y for X is reduced, Y' will be lower than Y, and if it is increased Y' will be

<sup>1</sup> That is Dr Hicks's "Marginal rate of substitution" (see Note, p. 157). The curvature of an indifference (or iso-productivity) line shows that the "marginal rate of substitution" changes as we move along it. Therefore, when a marginal substitution is effected along the indifference curve there are two changes effected, (a) the rate of substitution and (b) the relative proportions of the two commodities or resources, A and B. From this we may deduce an Elasticity of Substitution by expressing the change of proportions of A and B as a ratio of the change of the marginal rate of substitution. At every point on the indifference curve, then, there is an Elasticity of Substitution which measures the change of proportions of resources per small unit of change in the marginal rate of substitution. This Elasticity of Substitution seems to be established as the elasticity of substitution. It is not identical with that which we have given on p. 161. The latter is, of course, the ratio which is ultimately required, and the former is an analytical tool which it is necessary to use to understand the determination of the former.

See Hicks, J. R., "A Reconsideration of the Theory of Value," part i, *Economica*, 1934 (also Allen, R. G. D., part ii, 1934, for the mathematical treatment). Lerner, A. P., "Note on the Elasticity of Substitution," *Review of Economic Studies*, 1933. Joan Robinson, *Economics of Imperfect Competition*, p. 256. Kahn, R. F., "Elasticity of Substitution: Two Applications of the Concept," *Economic Journal*, 1935.

higher than Y. The significance of this is that the resources at our administrator's disposal are changed. Let  $P'$  be the new maximum productivity point with a new combination of resources,  $Oy'$  and  $Ox'$ .

When a person moves from one point on a hill to another, which is higher or lower, his movement may be analysed into two components: he moves *along the contours* and he moves *from one contour to another*. So, when our administrator moves on the "hill of productivity", he moves *along* the iso-productivity lines (or indifference curves) and he moves *across* them, from one to another: this is what happens in our diagram when  $P$  moves to  $P'$ . Why he moves as he does we are now in a position to explain.

It is clear at once that the location of the point  $P$  (or  $P'$  etc.) depends upon the interrelationships of the indifference lines and the price lines and an explanation involves our noting the types of relationships or, rather, the conditions of the relationships.

In the first place the location of the "possible substitution line" (the price line or "path of possibility") depends upon (a) the starting point and (b) the physical possibilities of changing the proportions of the resources, reflected in the slope of the line. If our administrator's starting point  $X$  were removed to the right, the line of similar substitution possibilities (the "path of possibility") would run across the map parallel to  $XY$  and it would touch another indifference curve giving a new combination of  $A$  and  $B$ . A change in the physical possibilities is then a change in the slope of the line.

Now it should be noted that a change in the slope of the line always means a change in the resources available, as noted above, so it follows that the change in the proportions of resources employed must be attributed in part to the inevitable change in resources possessed which a change of price brings about.

In the second place the movement across the hill depends upon the "shape" of the hill. This means that it depends upon the *curvatures* of the indifference lines and their *relative* curvatures. In the third place it depends upon the *locations* of these curves. The elasticity of substitution of an indifference curve is a conception which connects the quantities of the resources and the rates of substitution denoted by the slopes of the curves.

These features are what we may regard as the technical facts in the situation. Given the "map of productivities", the "location" of the administrator on the map, and his price line or "path", all that happens with a change in price or possessions can be seen. The conceptions which a contemplation of the map will make us form are conceptions of various kinds of elasticity: there are

elasticities of substitution, elasticities of employment of factors, and elasticities of production. These elasticities may be evoked by changes in "price" of one resource in terms of the other, which, of course, gives change of relative prices that may be separately noted, and change of possessions, of one or both resources and so we may speak of "price-elasticities" and "possession elasticities".<sup>1</sup>

It is necessary to review what has been said and note some of the assumptions upon which we have worked. Some of them, we shall find, are such as limit the universality of our generalization in certain respects. In some ways, indeed, we shall discover that we have done little more than provide ourselves with a "technique of thinking".<sup>2</sup> There are four such assumptions.

*The first assumption* is that it is possible to measure in all our activities a *physical product*. In thinking of gardening operations it is, of course, easy to think of quantities of potatoes, quantities of flowers, and so on. The manufacturer of boots can think of the quantity of boots which his factory turns out and the mining director can think of tons of coal. These "products" are apparently measurable and really measurable. There are some products, however, which defy physical measurement though they are determined by physical conditions. The early economists were puzzled by these and frankly refused to consider them as products at all. Thus, for a considerable period there was a doubt as to whether transport workers produced anything; for a longer period there was no doubt at all that artists "produced" nothing.

It is, of course, perfectly true that all products have a physical counterpart but, as we have emphasized in the earlier chapters of this book, men are not concerned about the making of things; they are concerned about the making of *patterns* of things.<sup>3</sup> A physical product is a pattern and if we are to discuss the physical limitations within which men work we must discuss the limitations upon all pattern making. A pattern is not a thing that can be measured quantitatively, it may be more or less elaborate; there are elements in the pattern which may be more or less, but a pattern is not capable of being considered as more or less in the sense that

<sup>1</sup> Hicks, J. R., loc. cit. This is an extremely important contribution to economic theory. Dr. Hicks uses his analysis in order to re-state the theory of value. Here we have attempted to show the physical counterparts when the maximum physical product is the desired end.

<sup>2</sup> Keynes, J. M., *General Introduction to Cambridge Economic Handbooks*

<sup>3</sup> "To produce, as far as political economy is concerned, is to occasion an alteration in the condition of the existing particles of matter, for the occasioning of which alteration, or for the things thence resulting, something may be obtained in exchange. This alteration is a product." Senior, N. W., *Political Economy*, 5th ed., p. 50. We except the "sale" condition.

a more complete pattern is a little larger than a less complete pattern.

A pattern is a scheme of relationships, of spatial and temporal juxtapositions. When something is produced, a change in a certain scheme of relationships is made, a new relationship is established. Relationships are not things that can be measured quantitatively: there are certain "indicators" of relationships, and these may register more or less, but the relationship is not greater or less in a physical sense.

We can illustrate our point by taking once more a gardening illustration. Some gardeners are landscape workers; their whole purpose is the arrangement of things. We may say that they put so much stone here, so much water there, so much flowering material here, and so much shrubbery there, we may say that when the most effective design is attained the marginal productivity of the flowering patch and the marginal productivity of the water surface and the marginal productivities of *all* the elements in the pattern are proportional to their substitution prices, but the productivities we are considering are not physical products that are capable of physical measurements; we may call the product "beauty" or satisfactoriness or even money's worth, but we cannot call it a measurable physical product. It is a physical scheme and any change is a physical change, but we cannot speak of a unit of such change in general.

Some writers have attempted to overcome the difficulties here mentioned by suggesting that all products should be regarded as *services*. This, however, does not overcome the difficulty. Materials and energies "serve" by being in the form and place and time locations which are wanted, that is by being in certain relationships. As we have said, however, relationships of these kinds cannot be measured in magnitude. A factor renders a service when it contributes towards satisfaction; the product then is satisfaction, and services, if they are to mean anything, must mean relationships producing satisfactions. They are certainly not physical things.

The position would seem to be, then, that some products can be measured physically and others cannot, but that those which can, do, provide us with data which enable us to produce a technique of thinking. They indicate the kind of physical limitation and freedom within which men administer their resources.

*The second assumption* upon which we have pursued our discussion is that the variable factors of production are infinitely divisible. Some writers criticize the conclusions at which we have arrived on the ground that this assumption is not correct. They point out that many factors are incapable of "minute" changes, that their

physical structure forbids such changes. For instance, a factory proprietor cannot increase his building volume by a cubic inch at a time and he cannot increase his labour force by less than a man at a time, a railway company cannot increase its track an inch at a time, and a householder cannot increase the baths in his house by less than a bath at a time. Instead of the proportional quantities of the various factors in a group changing gradually and continuously by imperceptibly small amounts, they change in steps<sup>1</sup>

To understand the significance of this criticism we must consider the effect of the discontinuous application of factors in the two circumstances which we have studied; that is, we must consider the effect (a) when factors may be added with no "sacrifice" of other factors and (b) when substitution must take place

The first case we can explain by reference to the table on page 139 which we used at the beginning of this chapter. If, instead of taking single units of factor increment, we take five units together, we have the difficulty revealed at once. The table given will then appear in the following modified form —

| Factor<br>Total units | Product<br>Total units | Increment of |         |
|-----------------------|------------------------|--------------|---------|
|                       |                        | Factor       | Product |
| 0                     | 0                      | —            | —       |
| 5                     | 15.0                   | 5            | 15.0    |
| 10                    | 82.5                   | 5            | 67.5    |
| 15                    | 175.0                  | 5            | 92.5    |
| 20                    | 230.0                  | 5            | 55.0    |
| 25                    | 210.0                  | 5            | — 20.0  |

From our original table of small increments of factor we know that the maximum increment is reached at the 12-13th and the maximum total at the 21st. From this table we see that the maximum increment is at the 3rd (which may be taken as corresponding to the 15th in the original table), and the maximum total at the 4th (which might correspond to the 20th). We expect the product increments to be bigger, so that fact need not delay us, but the maximum appears as 230 against 231.5 by smaller increments.

This simply confirms a well known fact of ordinary living: when delicate and accurate work is required in moulding, a large trowel may be useful at first, but a small tool must be used at the end. Further confirmation of the fact is also shown in the persistence of human endeavour to make all materials quantitatively variable in small proportions. The criticism then, on this count, holds.

In the case of substitution we have to review the relationship

<sup>1</sup> See Wicksell, K, *Lectures on Political Economy*, 1, pp. 68-72.

between final or "*marginal*" *productivities* and the *marginal substitution prices*, of factors which are not infinitely divisible. This will involve our retracing the argument we employed before when we made the assumption of infinite divisibility.

As in the former case, we must, in order to analyse the situation, assume in the first instance that the factors (we will assume for convenience of statement that we are dealing with two only) are so combined that the maximum product is attained. Further, again as a convenience of statement, we will assume that our units,

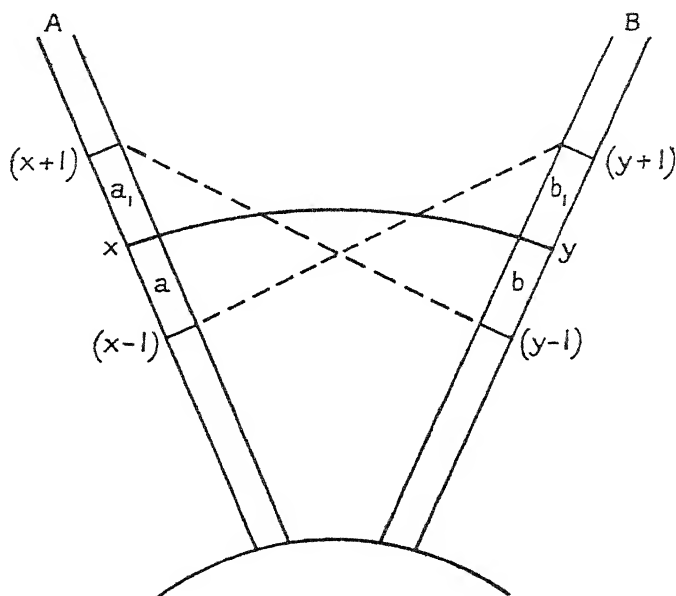


DIAGRAM V

though indivisible, are, in fact, in separable *groups* of measurable units: that is, we will reckon one increment as 5 or 6 units; (later, we will drop this assumption). Finally, we will assume "*marginal*" substitution price of 1 unit of A for 1 unit of B (group units in both cases, a group of A being 5 units and a group of B, 6 units). These groups are the inseparable groups or indivisible units.

Now it follows from our assumption that P is the maximum product, and that  $x$  units of A and  $y$  units of B produce it, that  $(x+1)$  units of A and  $(y-1)$  units of B or  $(x-1)$  units of A and  $(y+1)$  units of B produce less than P. This means that the substitution of 1 unit of A for 1 unit of B (or the reverse substitution)

causes the diminution : the *extra* unit in one direction does not make up for the loss effected by the withdrawal of the *marginal* unit sacrificed in the other direction. What we called "substitute productivity" is less than the productivity of the unit which is substituted or less than *substitution cost*.

We may now turn to Diagram V to visualize the situation. The employments of A and B are shown in the radiating parallelograms. The symbols  $x$  and  $y$  show the amounts of the factors which in combination produce the maximum P. The symbols  $(x + 1)$ , and  $(y - 1)$ ,  $(x - 1)$ , and  $(y + 1)$ , joined by broken lines, show the combinations of these factors when a substitution of 1 unit of A is made for 1 unit of B or the reverse substitution is made.

The symbols  $a$  and  $b$  show the physical productivities of the final units of A and B respectively employed when the maximum is produced: that is, they show respectively the productivities of the  $x$ th unit of A and the  $y$ th unit of B. When a substitution of 1 unit of B is made for 1 unit of A then  $a$  is "sacrificed" and  $b$  is substituted, but since this combination produces less than P it follows that  $b_1$  is less than  $a$ , that is, the "extra-marginal" unit of B is less productive than the "marginal" unit of A. If the substitution is made the other way, then it can similarly be shown that  $a_1$  is less than  $b$  or the "extra-marginal" productivity of A is less than the "marginal productivity" of B.

It is impossible that  $a$  should be equal to or less than  $b_1$  (or that  $b$  should be equal to or less than  $a_1$ ), for in the first case the product P would be producible by  $(x - 1)$  units of A and  $(y + 1)$  units of B (or the reverse arrangement), or the new product would be greater and we are assuming that  $x$  of A and  $y$  of B give the maximum P, and no other combination does so.

This is the core of the argument. In our earlier arguments we assumed that a substitution could be so small that the difference between the marginal product of one factor and the extra-marginal product of the other would be so small as to be insignificant. Here we are assuming that  $b_1$  is less than  $a$  by a significant amount (and that  $a_1$  is less than  $b$  by a significant amount).

Further, in our former argument, we assumed that the units of A and B were so small that the marginal and extra-marginal productivities of each factor were equal or so nearly equal that the difference was insignificant. Thus the difference between our present case and our earlier one may be expressed as follows:—

In our first discussion  $a = b_1$ ,  $b = b_1$ ,  $a = b$ .

$b = a_1$ ,  $a = a_1$ ,  $b = a$ .

that is,  $a = a_1 = b = b_1$ .



In this discussion we find  $a > b_1$ ,  $b > a_1$ , and we know nothing about the ratio of  $a$  to  $a_1$ , or  $b$  to  $b_1$ , or  $a$  to  $b$ .

We must now consider the reason for our reckoning 1 unit of A as a group of 5 units and 1 unit of B as a group of 6 units. It enables us to show further still the difference between the present discussion and the former one. In this way we can say that we have a "substitution price" of  $\frac{5}{6}$  units of A per unit of B, or  $\frac{6}{5}$  units of B per unit of A.

If the "marginal group" of A produces  $a$  then the "average product" per small unit is  $\frac{a}{5}$  and the "extra-marginal" unit group of B has an "average" product per small unit of  $\frac{b_1}{6}$ . In our last discussion we assumed that these average productivities were "marginal" productivities and since we also assumed  $a = b_1$ , we said that

marginal product of  $A \times 5 =$  marginal product of  $B \times 6$ ,  
 or  $\frac{\text{marginal product of } A}{\text{marginal product of } B} = \frac{6}{5} =$  substitute price of A in terms of B.

In this discussion we know that  $a$  is greater than  $b_1$ , and we cannot assume that the average product per small unit of a substitute group is equal to the marginal productivity or productivity of an infinitesimal amount. All that we can say is as follows:—

(Average product per unit of substitute group  $A \times 5$ ) is greater than (average product per unit of substitute group  $B \times 6$ ) or, the ratio of the average product per unit in the substitute groups, A and B, is greater than the substitution price of A in terms of B (and the ratio of the average product per unit of the substitute groups B and A is greater than the substitution price of B in terms of A).

The conclusion to be drawn from this is, that when units of factors are in inseparable groups, substitution will take place until the maximum possible is attained but this maximum is less than it would be if the units in the group were separable. A change in the substitution prices of the factors may make possible a change that gives an increase but unless the substitution productivities are equal then one of the factors is "underemployed" and the other is "overemployed".

If we drop the assumption that the indivisible unit of factor is an inseparable group of units and treat it as a single unit we have a substitution price of unity in our example whether we substitute

A for B or B for A. We made this assumption, it will be remembered, in order to produce an argument parallel with our former one. It will be seen, however, that the conclusion at which we have arrived is not altered. The ratio of the extra-marginal productivity of either factor to the marginal productivity of the other is, when a maximum production is attained, less than unity or, at its greatest, equal to unity, when infinitesimal adjustments cannot be made. If the argument is complete, then the great principle which we laid down on page 157 must be modified and made to run somewhat as follows:—

*When a group of different factors is capable of variation in relative quantities, but the variation of absolute quantity in one direction can only take place through a variation in another or others, then the condition of a maximum product is that the marginal or minimum substitution that can be made of any factor for any other causes no change or a decrease of total production.*

This implies that the ratio of the productivity of the least substitutable quantity of one factor is equal to or greater than the productivity of the corresponding quantity of the other factor which can be substituted for it or, in other words, these productivities are in a ratio equal to or less than the substitution price of the least quantity of substitute that can be acquired. Where substitution of infinitesimally small magnitude can be made we have a special case of equality of marginal productivity ratios and substitution prices; in other cases we have not marginal adjustment, strictly speaking, but we have "overemployment" of one factor and "underemployment" of another with respect to a conceivable maximum.<sup>1</sup>

Of course, it need hardly be pointed out that the whole of what has been said applies to those cases where physical product can be measured in physical units. In those cases where the product is simply a new situation not capable of quantitative assessment it follows that the product must be measured as service (and this means satisfaction) or its money value.

*The third assumption* upon which we developed our analysis of the relationships between physical factors and products was that we were dealing with a single act of production at a moment of time. In actual fact, of course, our economic organization is a flow and something must, therefore, be said of the applicability of the preceding argument to flow conditions.

In the discussion of relationships in a momentary scheme we considered quantities of factors in physical units, pounds weight,

<sup>1</sup> Hicks, J. R., *Theory of Wages*

gallons, etc. In the discussion of a "flowing scheme" the element of time enters and, therefore, new units must be devised including this dimension

There are two modes of introducing this element. In the one, we may speak of a unit of "factor-time" such, for example, as a man-hour, an engine-hour, etc., or, in the other, we may speak of a rate of flow of factors and products, as for example, so many tons or yards per annum and so much output per annum or per diem, etc. The change from the momentary act to the continuous process does not, however, introduce any new circumstances. An increase of a factor is an increase of "factor-time" units or an increase of the rate of "flow"; likewise an increase of product is an increase of "flow". The discussion of marginal products and marginal substitution prices needs, in this case, to be carried on in terms of marginal changes of rates of flow and marginal substitution ratios of rates of flow of factors

*The fourth and last assumption* upon which we worked in our earlier discussion was that the product was a single one. It is impossible to measure a unit of multiple physical products (except in the case of unchanging proportions in a group unit) and, therefore, no quantitative relationships can be stated between them. We have already indicated that some "single" products cannot be measured and we have suggested that the only way of dealing with such is to consider them as units of satisfaction or money's worth. This is the only way of dealing with multiple products, but we are not here considering satisfaction or money product and, therefore, we must leave the matter till later.

There is one important aspect of physical production to which we have hitherto made no reference of any moment, namely, the effect of taking time to attain a maximum product. So far, we have treated production as a matter simply of making physical patterns in *space* but it is common experience that by fixing the production of a quantity of product to be attained at some time in the future a larger quantity or a better quality or even, in some cases, some quantity at all can be produced.

We do not refer to the production of things for the future made necessary by the prospective lack of resources in that future as, for example, the making of jam to preserve fruit for use in times when fruits are not available. There is, of course, a physical condition that determines the possibility of this, namely, the possession of resources in excess of immediate requirements and so available for devotion to future ends. Nor do we refer to the production of things which require seasoned materials or are, in themselves, seasoned or matured, as, for example, the making of furniture that does

not warp and shrink or the serving of old vintages of wine. The thing which we have in mind is the production of goods by what is known as the "roundabout" method, the making of intermediate resources whose production is decided upon simply in order that a production of something else by its use may be made greater or better, or existent at all in some cases.<sup>1</sup>

Since we are here concerned only with the physical possibilities and limitations within which men work we must be careful to note that we can give no consideration at all to the psychical or financial significance of production at any particular time or through any particular period though, of course, in actual life, this is the vital matter; we shall consider it in later chapters. All that we are concerned with is the "physical significance" of time.

Now the "physical significance of time" from the point of view of organization is that it makes possible the employment of a larger quantity of resources towards the production of any given commodity or service: it gives, as it were, a larger volume of resources available for any given end—if that end is placed in the future. The direction of resources towards a distant future end instead of an immediate end involves, of course, "saving and investment" or, to use terminology appropriate to a purely physical view of the process, it involves accumulations of the products of labour and other resources as *intermediate* resources or resources which are *in process* towards the distant future end. Obviously, if resources are devoted to distant ends they cannot (normally) be devoted to near ends (and vice versa).

When physical production through time is considered it is important to bear in mind what we said immediately above, namely, that there is no significance to be attached to a product at any particular time, we must be careful *not to consider values*. Thus 1 unit of product produced 10 years hence is of the same *magnitude* as 1 unit of the same product produced to-day or to-morrow and 2 units produced next year are twice as large as 1 unit to-day. From this it would seem, therefore, that the further away in the distant future we place the production of a commodity the larger the quantity of that commodity we can produce since we can save more resources. As one writer has expressed it, we could, theoretically, produce an indefinite amount of any commodity if we were willing to save through an indefinite time.

It will be seen at once that, if this analysis of the "physical significance" of time is correct, we cannot possibly speak of the conditions of any maximum production by a unit through time; that is, the productivity of allocations of resources to the future

<sup>1</sup> Hayek, F. A. von, *Prices and Production*, p. 35.

is always greater than the productivity of allocations to the present or very near future. We can, of course, say that there is a limit fixed to the future by the quantity of resources which *can be spared* from the present but this brings in the consideration of value significance.

This conclusion is of profound importance. Attempts have been made by some economists to explain the existence of interest on a conception of the greater physical productivity of "saved-up labour<sup>1</sup> and saved up land services". This consideration of the physical significance of time shows that the weighing of future productivity against present productivity is entirely a weighing of values. It is true that if the "roundabout method of production" causes, in general, an increase of physical productivity, this fact is of significance, but resources can be saved to produce a smaller volume in the future rather than a larger volume in the present if this smaller volume has a greater value than the larger. But consideration of this matter belongs to another part of this work; here we are only concerned with physical productivity.<sup>2</sup>

On this point we may close this chapter. We have been concerned with a consideration of the physical limitations within which man attains his ends. These limitations we have discovered to be little more, substantially, than the limitations that are commonly known as "not being able to take blood out of a stone", "to put more than a pint into a pint pot", "to be in two places at once", etc. In our survey we have certainly exhibited an "instrument of thought", a set of conceptions that will help us later, but we have also learned that economics is not a physical science.

It may be said that no economist considers that his science is a physical science and it is true that no economist of repute does, but economic literature is strewn with theories that seem to imply that it is. The importance attached to the "physical law of diminishing returns" is a case in point. We have seen what the tendency to diminishing returns is in the course of our discussion—it is, however, no more an economic law or tendency than is the law of constant proportions in chemistry or the law of gravity in physics. These "laws" are, to the economist, simply the physical facts which man must recognize in his administration of his resources.

Man, in the process of administering his resources, must know the possibilities and impossibilities that physical conditions grant or impose: he must be a technician. Between a technician and an

<sup>1</sup> Wickseil, K., *Lectures on Pol Econ*, p. 154. Cf. Böhm-Bawerk, E. von, *Positive Theory of Capital*, and Jevons, W. S., *Theory of Pol. Econ*, on the productivity of time.

<sup>2</sup> Rosenstein-Rodan, P. N., "The Rôle of Time in Econ Theory," *Economica*, 1934.

administrator, however, there is a world of difference. The former can say how physical resources must be employed in order that a given physical result may be attained—he may even give alternative modes of attaining an end physically—but he cannot say whether the scheme he suggests as possible physically is possible administratively. The technician may say how a given area of land may be made to yield the maximum crop of wheat but he cannot say whether the maximum is worth while. Administration involves valuing of resources and ends and the technician has, as technician, no knowledge of values. The conception of “optimum” and even the conception of “efficiency” have no significance to the technician unless he has been told what to take as the criterion of “best.”

### CHAPTER III

## THE FINANCIAL ASPECT OF INTERNAL ADMINISTRATION

In this chapter we shall be concerned primarily with the business unit. From one point of view it may be said that the function of a business is to supply goods or services to the consumers : this is the consumer's point of view. From another point of view it may be regarded as the source of income, to those who supply resources, this is the factor owner's point of view. The point of view which we shall take here, however, is that of the controlling body and from this point of view the business is an institution for making money in the form of profit. True it is that all owners of factors are interested in the business in the same form and that the profit made by a business is the income of a factor owner, a "capitalist" of some kind. The capitalist with whom we are concerned, however, is somewhat different in status in the organization from the capitalists of other kinds, he is what we call the owner of the business, the owner of the right to run the business. We do best if we work with the conception of the business as a kind of corporate body, invest it with a "fictitious personality"<sup>1</sup> and let our point of view be that of this nebulous creature, the "alter ego" of the one who receives the uncovenanted share of the business<sup>2</sup>. If the company or business is known as Kayell, Ltd., we may say that our point of view is that of "Mr. Kayell".

From this point of view, then, business organization is a profit making device and profit we reckon in money. The possessions of Mr. Kayell are money or money's worth, or things that can be converted into money. Business activities are processes of using money : the original capital for starting the business is money or things that can be turned into money : the employment of labour is the spending of money ; the hiring of capital from shareholders, bondholders, etc., is the expenditure of interest, dividends, profits the hiring of real property is the payment of money rent ; the purchase of goods or services is the payment of money. The sale of goods and services on the other hand is the purchase of money, and sales returns are "products".

<sup>1</sup> Fisher, I, *Elementary Principles of Economics*, p. 40

<sup>2</sup> See Tuttle, C. W., "The Function of the Entrepreneur," *Amer. Econ. Review*, 1927

For the purposes of this present discussion we must assume that the price scheme in the market is given and stable; then, when Mr Kayell, if he is a baker, mixes his flour, yeast, etc., to produce bread, he is able to calculate—knowing his prices *and* his baking technique—the prices he must “mix together” to “produce” prices of bread. Prices do, in actual fact, move relatively to each other and so it is possible for Mr. Kayell to reap a money product greater or less than he intended or expected, but we will exclude these changes from our consideration in order to study the principles of financial administration in simpler conditions.

It will be clear that the work of a business falls into two parts, buying and selling (the commercial part), and the processes of manufacturing, transportation, etc., (the technical part). We have already surveyed the physical aspect of administration and we shall here assume that the technique of the business is known and action in accordance with its necessities taken. The characteristic of a business is that it cannot make money without “selling” money (for “factors”) and “buying” money (with products) with a difference due to the “purchase” of money being larger than its “sales” of money.

Just as we saw in our study of the physical aspect of the administration of resources that we can present a scheme of physical activity in the form of a diagram so we can present the financial aspect of a business organization in the form of a diagram. We can make a diagram of money allocations in various directions, corresponding to the diagram of factors employed. Further, as we saw in our last chapter also, we can present our diagrams as schemes of allocation at a moment of time or over a period of time. Thus we can show how the *capital* of the business is allocated to land, buildings, machines, etc. (fixed capital) and to the purchase of stocks of labour, coal, raw materials, etc., (circulating capital.) On the product side also we can produce a diagram showing the values of stocks, equipment, etc., remembering that, when we take a momentary view, our diagram of products is simply a diagram of resources held, like the diagram of factors. On the other hand, we can make a diagram showing the *expenditure* over a period of time—expenditure on labour, raw materials, replacement of “fixed” equipment, etc., and a diagram showing returns on various sales over a period of time.

The insuperable difficulty, which we found in the previous chapter, of computing a total of diverse resources or products does not arise when we examine the financial aspect of business administration. Since all resources and all products (joint, main, by- or waste) can be reduced to money value we can speak of total input and total output of all factors and all products respectively and of a *net output*



There is a question of convenience to be considered, however, in the choice of the mode of representing the input and the output.

As we have just said, we might consider either of two schemes of input, the allocations of capital or the allocations of expenditure over a period<sup>1</sup>. If we take the former we must take it at a given moment; if we take the latter we must take a period of time, say, the accounting period of a year. The difference between the two schemes is due to the time element, capital allocation is essentially

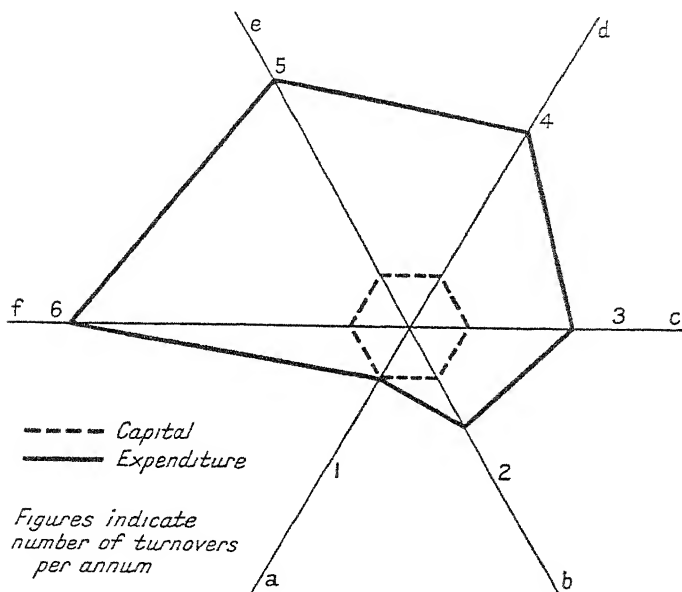


DIAGRAM W

an allocation of money or money's worth at a moment of time, and expenditure distribution is essentially a scheme of rates of expenditure or flows of capital over a unit period.

The time element is a complicating element in our calculations because it introduces the question of the rate of turnover. It is common knowledge that a jeweller "turns over" his stock—that is, buys and sells it—at a slower rate than a greengrocer "turns over" his vegetables. From this we see that a greengrocer with, at any moment, £100 worth of vegetables will, during a year, expend on vegetables something like 200 or 300 times the £100: considering them as fresh vegetables which he renews daily, he

<sup>1</sup> Clark, J. M., *Economics of Overhead Costs*, chs. 8 and 19.

will spend his £100 as many times as there are days on which he sells. On the other hand, a jeweller may dispose of a given £100 worth only once in a year and, in some cases, even less rapidly. For every £100 worth of stock held, he will, then, with one turnover per annum, expend £100 per annum. Different kinds of stock have different rates of turnover and any scheme of allocation of capital values at a moment of time inevitably shows a different "shape" from the corresponding shape of the pattern of expenditure involved in its maintenance.

Diagram W shows this difference in shape between the pattern of capital allocation and the pattern of annual expenditure in a business holding six different kinds of stock whose turnovers or replacements are once, twice, three, four, five, and six times per annum respectively. If we reckon the capital in each case as £100 then the corresponding expenditures, necessary for their maintenance, are £100, £200, £300, £400, £500, and £600 respectively.

The process of administration of money consists of changing the allocations of either capital or expenditure so that a given result is attained, such as the maximum profit. The process of changing allocations is a process of transference and it is obvious that an administrator will expect that a decrease of allocation in one direction by  $x$  units will enable him to increase his allocation in another direction by  $x$  units, or, in other words, to reallocate the whole with no change of that whole. If he takes as his pattern of administration the pattern of annual expenditure he will find that he cannot reallocate the whole of his resources by a simple transference of  $x$  units from one line to another, but if he uses the capital allocation pattern he will find that he can. An illustration will make the point clear.

Let us suppose Mr. Kayell is a shopkeeper who sells fresh vegetables and canned vegetables and that his stocks of the two commodities at the beginning of the year are ten pounds' worth of each. Let us further suppose that the turnover of fresh vegetables is 200 times a year and that of the canned vegetables 50 times a year. It follows then from these figures that he spends £2,000 per annum on the former and £500 per annum on the latter.

Now let us suppose that our shopkeeper changes his scheme and decides to enlarge the fresh vegetables side of his business. His capital in the two commodities together is £20 and his annual expenditure on the maintenance of his stock is £2,500. A change of scheme means a change in the allocations of the £20 or the £2,500.

If he decides to change his capital allocation, say, by £2, the stocks he turns over will now be £8 on canned vegetables and £12 on fresh vegetables. Assuming the rates of turnover to remain the

same his annual replacement expenditures change from £500 and £2,000 to £400 and £2,400 respectively ; that is, one expenditure is reduced by £100 and the other is increased by £400.

If, however, he determines to change his expenditure allocations by reducing the annual expenditure on canned vegetables by £100 and increasing the annual expenditure on fresh vegetables by £100 he decreases the capital locked up in canned vegetables by £2 and increases the capital locked up in fresh vegetables by 10s because capital locked up equals the expenditure on maintenance divided by the number of turnovers per annum. By reducing one capital allocation by £2 and increasing another by 10s he finds himself with 30s unaccounted for. Except when the rates of turnover are equal it is impossible to transfer a quantity of expenditure per annum from one line to another without releasing, or finding a shortage of, capital.

Now the pattern of a business administration is not merely a pattern of capital allocations or inputs ; it is quite as truly a pattern of products or outputs. One pattern changes into the other, and the difference between input and output patterns is that which is due to one thing being before the other, in time order. The two patterns are examples of the familiar "before and after" records in photography. Whether we consider the resources and products in terms of physical things or money values the distinction between input and output remains the same ; input is that which exists at the beginning of the act of administration and output is that which exists at the end.

To those who are familiar with accountancy practice it will be clear that this is the conception employed by accountants ; through all the intricacies of detail in books and accounts devised by that profession the ultimate goal at which they aim is the discovery of the money values possessed at the beginning and the end of the accounting period. They calculate these total values at the beginning by reckoning stock values (raw materials, buildings, machinery, finished goods in hand), money at the bank and in hand, values of securities, debts owing and due ; at the end they make the corresponding calculations and the difference they call profit or loss. It is not their practice to call the equipment of the business a part of their "product"—this term they reserve for some specific commodity or service which is sold, such as wheat, boots, etc.—but, from the point of view of logic, it is clear that that which exists at the end of the accounting period must be regarded as the product of that which existed at the beginning.

Strictly speaking, it is best to regard the value possessed by a firm at the end of the accounting period as the cumulative product

of that which was possessed at the beginning Business administration is a continuous process and should, during a period of time, be regarded as a series of momentary acts of administration, a process of continuous "sale" and reinvestment of the proceeds, a continuous reallocation of money capital The flow of sales returns during an accounting period is a continuous replacement of the money possessed by the firm and the flow of expenditure is a continuous replacement of real resources or securities A year's administration is, then, an infinite number of inputs and outputs with an infinite number of accretions and decrections of money capital known as profits and losses

In actual fact, of course, a business man does not continually sell, buy back and resell all his possessions, he sells his productions, buys replacements of resources consumed, and sells again. He conceives of his business as a reservoir into which his sales returns flow and out of which goes his expenditure and the profit (or loss) which he makes is the difference between inflow and outflow This is a perfectly correct procedure but the ordinary terms "expenditure" and "sales returns" are not adequate expenditure, as he very well knows, must be stretched to include depreciation and wear and tear His inclusion of these elements implies that his conception of expenditure and income are of flows of capital —(outflow and inflow of capital values respectively). One thing is certain, however, and that is, he never calculates his "prosperity" by relating his profit to his sales returns, this he always relates to capital invested<sup>1</sup> He may, on occasion, for purposes of "justifying" his profits to his customers, say that his profit on turnover is very small but he knows that a small profit on a quick turnover is frequently good business! We return then to the position which we have stated before, namely, that business administration is properly regarded as a series of momentary acts consisting of the "spending" of a capital sum and the "selling" of the whole quantity of resources (after technical changes, if any, or "time" changes such as the maturing of wine or cheese), the difference being profit or loss; the object of the administration is the maximization of profit (or minimization of loss)

It is the object of this chapter to expound the conditions that must hold of a business which is administered so as to produce this maximum profit (or minimum loss) From what we have said it is our object, then, to discover the conditions that determine the maximum increase (or minimum decrease) in value of the resources on which a given capital sum of money is allocated or the conditions that determine the maximum difference between income and outgo

<sup>1</sup> See Marshall, A., *Principles*, pp 614–17.

We shall deal with the administration of capital values first and then study the administration of "outgo and income" flows.<sup>1</sup>

It will facilitate our study if we return to the case of Mr Kayell : we shall not at first treat him as the "persona ficta" within a trading company but, instead, we shall take him as a man of flesh and blood, desirous of making the most of £800 of cash which he possesses. We shall assume that he ventures forth with it in a boot manufacturing business.

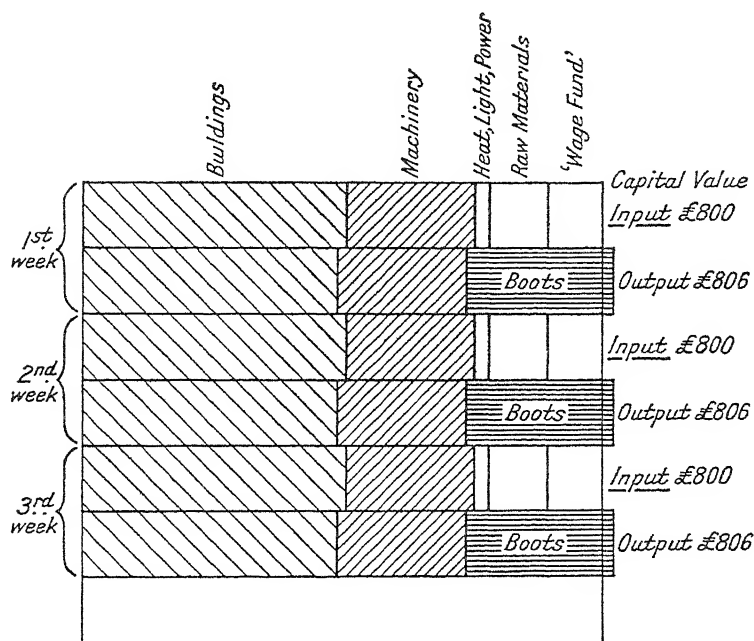


DIAGRAM X

The first thing that our business man does—so far as we are concerned—is to allocate his capital to various resources: he divides it into smaller capitals. Some of it he locks up in buildings, some in machinery, some in raw materials, some in heat, light, and power, and some he keeps as a "wage fund". The figures below may be taken as such an allocation

|                  |                 |                           |                      |                  |
|------------------|-----------------|---------------------------|----------------------|------------------|
| <i>Buildings</i> | <i>Machines</i> | <i>Heat, Light, Power</i> | <i>Raw Materials</i> | <i>Wage Fund</i> |
| £400             | £200            | £20                       | £100                 | £80              |

We shall take the period of a single act of administration as

<sup>1</sup> No business can commence without capital, since no administration is possible without resources

a week and assume that the raw materials, heat, power, light, and labour allocations represent a week's consumption of these resources the buildings and machines are not, of course, fully used during this period

The *physical* change that takes place is the production of boots and the consumption of resources. At the end of the week the *value* possessed by Mr Kayell is distributed in a different *scheme* and is *larger* if he makes a profit. We may represent the position in the following imaginary figures:—

|                  |                  |                           |                   |                      |               |
|------------------|------------------|---------------------------|-------------------|----------------------|---------------|
| <i>Buildings</i> | <i>Machinery</i> | <i>Heat, Light, Power</i> | <i>Wages Fund</i> | <i>Raw Materials</i> | <i>Boots.</i> |
| £398             | £198             | £0                        | £0                | £0                   | £210          |

The total of this is £806, the additional £6 being what he regards as his profit on the £800 of capital

Assuming that the business continues in the same form, the following week sees the reallocation of £800 as before and the paying into the "profit" account of another £6. This we suppose to be carried on indefinitely. Diagram X then shows the flows of allocation and valuation of capital and product respectively, week by week

Now the first point to note in the diagram is that the total input of the business is £800 a week and the total output is £806 a week, giving a difference of £6 of profit a week. The second point to observe is, however, that some of the capital values allocated depreciate during the week and others (boots) appreciate. The total amount of depreciation is £204 a week and the total appreciation is £210 a week: the difference between these is also £6 a week. If we call the depreciations "outgo" and the appreciations "income" it will be seen that the profit each week may be regarded as the appreciation of the total capital value employed *or* as the difference between outgo and income each week

We have said that Kayell has a sum of £800 invested in his boot-making business. This would seem to suggest that we have fixed the size of the capital allocation and that we have only to consider the shape of the investment pattern. There is, however, no need for us to take leave of reality and disregard the conditions that determine the amount that he invests in this particular business. We must interpret the position as one in which he finds that £800 invested in bootmaking gives him the maximum profit that he considers worth while collecting in this business.

The investment of £800 which Kayell makes in his bootmaking is, after all, only a part of the resources he possesses. At any given moment he must make provision for his current living and he may, in addition, have funds hoarded, in the bank, or invested in other

securities The £800 here invested is, then, but an element in Kayell's general pattern of capital allocation and the consideration of the *size* of his investment in boot manufacturing is bound up with a consideration of the shape of his general allocation of capital. Diagram Y represents a possible pattern of this general allocation of which the boot manufacturing investment is one part.

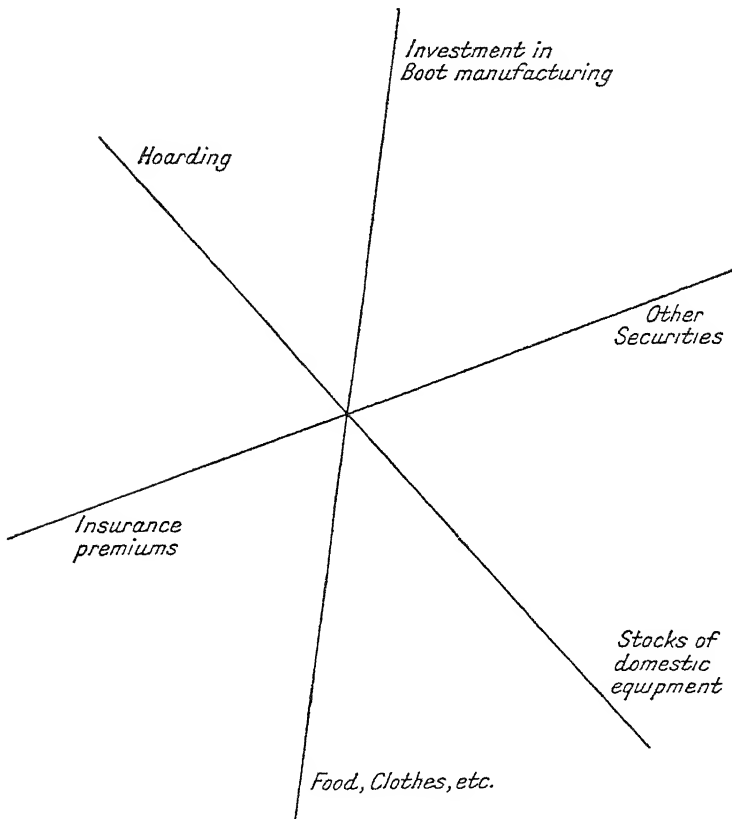


DIAGRAM Y

On the assumption that Kayell administers his resources to the best advantage it follows as a corollary that he cannot make any reallocation of capital to advantage. He cannot reduce his spending and increase any other line of disposal or reduce his hoarding for the same purpose without reducing the general advantage gained from his scheme of distribution. In short, he cannot make any

advantageous substitutions. If it is possible for him to make infinitely small variations in the amounts allocated in all directions it is clear that the condition of maximum advantage is that the marginal attractions or marginal advantages in all directions are equal.

In this general allocation of capital the marginal equality to which we have referred must be an equality of satisfaction—a subjective equality—but if we assume that Kayell is operating in an ordinary economy, such as ours, it is clear that for purposes of testing the advantage of investment of funds in his bootmaking business he has the power of comparing money returns therefrom with possible money returns from other investments. We may say, therefore, that the marginal investment made in the boot business makes the same money returns as the marginal investment he makes in other securities if his capital is invested to greatest advantage.

It is possible, of course, that he has no other investments and that the only other purposes to which he devotes his money are spending on current living expenses (maintaining his domestic equipments), and hoarding. In this case he has no monetary profit with which he can compare the returns on his boot manufacturing investments. He will, nevertheless, invest more and more capital until his marginal investment yields a rate of profit that he regards as of equal satisfaction-giving capacity to the marginal allocation in spending and hoarding. The rate of profit we may say, for purposes of illustration, is 6 or 10 per cent per equal unit of time. If this is the position in which Kayell finds himself when he puts £800 into the boot business, then we can say that the yield of profit on the 800th pound is equal in attractiveness to the spending or hoarding of the final pound allocated in spending and hoarding and it may be any percentage yield whatsoever: the particular figure is peculiar to Kayell's circumstances.

There is, however, in our ordinary economy, a rate of profit on the marginal investment below which he will not go, this rate is that which he can obtain in other investments. If the rate of interest which he can obtain in other directions is 4 per cent per period then his marginal investment will not go below that figure. The question arises, though, whether he will invest so much as to bring down his marginal profit to 4 per cent. If he invests so much capital that he brings down his marginal rate of profit below what he can obtain elsewhere, he invests "redundantly" or overinvests; businesses sometimes do, in actual fact, find themselves with redundant capital which they either return to shareholders or invest in securities outside the business. If his marginal investment



yields a higher rate than he can obtain elsewhere, will he consider the position as one of under-investment and proceed to expand his investment ?

It must be remembered that we are examining the case of a particular individual, Kayell, and, as we have said, the limits to which he will go in his investment are determined by the principle of equi-marginal attractiveness of his allocations in all directions. Kayell is, however, not the business. If his marginal profit is 6 per cent <sup>1</sup> and capital is available in the market at 4 per cent he may extend the business by borrowing, for he will be able to give this 4 per cent on borrowed capital and collect at a difference for himself. The borrowing of capital makes possible the growth of a business to a size greater than that which Kayell, working with his own capital, will build up. This gives us the answer to the question asked above: if capital is free for investment at rates less than the marginal rate of profit on Kayell's own investment, the business is undersupplied with capital and a tendency exists for this lack of capital to be made good. Kayell does not make the investment but others do.

It would appear that we are travelling away from our illustration. We began by considering Kayell's use of £800 in a boot manufacturing business and we suggested that the business was a one-man business. We stated our problem as the consideration of the conditions determining the maximum profit on this sum. We have arrived now at a position in which we find that Kayell is possibly borrowing money from other capital owners to develop his business.

We are not, however, travelling from our original position: we are simply stating its full implication. If Kayell puts his £800 into a boot business with the object of winning the greatest profit it is clear that this greatest profit can only be earned if the business from which he draws the profit is making the biggest profit. If the business is a one-man business and £800 is the capital invested and earning the maximum profit it is simply a case of the business being such that no further borrowing can take place. The capital employed by a business tends to grow to such a point that the marginal yield on the capital is equal to the alternative earning capacity of the marginal investment. If there is a general rate of interest—a price at which free money capital can be borrowed—then the tendency of a business is to grow to such a size that its marginal profit equals this rate. If the marginal profit is greater than the ordinary price of capital then the business is undersupplied with capital and if it is less, then the business is oversupplied; in

<sup>1</sup> Keynes, J. M., *The General Theory of Employment, Interest, and Money*. Mr. Keynes calls this the "marginal efficiency of capital" pp. 135-146.

the former case new capital will flow into and in the latter case capital will flow out of the business

Diagram Z presents the general position which we have been explaining. The horizontal line represents the amount of capital at the disposal of the business. The curves show the increments of profit earned by successive increments of capital and the payments that must be made for the increments respectively. The amount of capital represented by OS is the amount which will be employed by a business unit operating at maximum profit. The line MS is the ordinate of a point common to both curves and represents both marginal earnings and the price of the marginal investment.

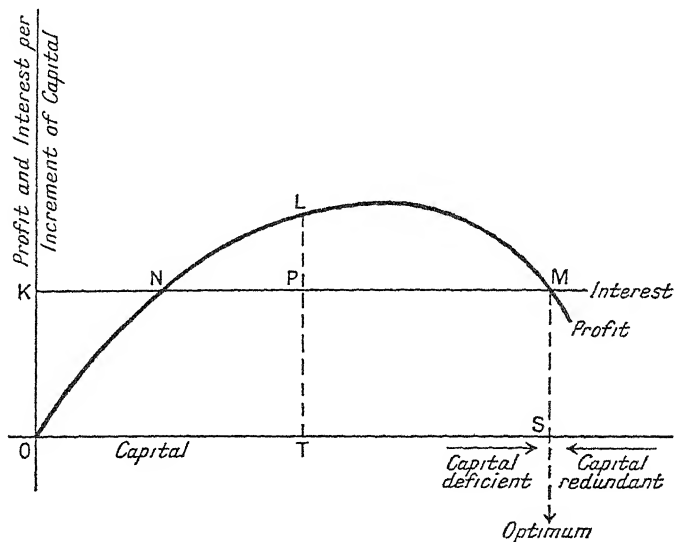


DIAGRAM Z

If the capital employment were greater than OS, the profit on the additional amount would be less than the price necessary to pay for the loan of it. If the capital employed were less, then there would clearly be an opportunity for making a profit by borrowing more capital: the arrows indicate where capital is entered or withdrawn.

A consideration of this diagram reveals the fact that hitherto we have been using a conception of profit—a conception frequently used in the market—which may be regarded as a “gross profit” to distinguish it from what may be called the “net profit” or “*particular investment return* or advantage.” A business, we have demonstrated, will not grow to (and remain permanently at) a size that will give a marginal investment yield lower than this

marginal investment could obtain elsewhere or, as we have before expressed it, the marginal investment yield, when the business is in equilibrium, equals the yield that could be obtained from the highest of other investments: in an ordinary way we may say that the marginal yield equals the rate of interest on free capital.

The gross profit in the business represented in the diagram (Z) is the area ONLMS, the amount paid for the loan of the capital employed is OKNPMS: the "net profit" or "particular investment return" is therefore the difference between the areas NLMP and OKN. The line MS represents the marginal yield or yield on the final increment of capital employed and is common to both, showing that, on this unit of capital, the "net profit" is zero.

This distinction between gross profit and net profit is of prime importance for it brings to light at once that a particular business tends to grow to such a point that its net profit is a maximum. Clearly, in the case given in the diagram the gross profit could be increased by putting in capital beyond the quantity OS, but this additional profit would only be obtained at a cost of possible other returns (at a cost of interest), for beyond OS the "price of borrowing" curve is higher than the investment yield or "profit curve".

We may now return to the consideration of the figures given in the imaginary business administration on page 183. There we took the case of Kayell investing £800 in a boot manufacturing concern. For purposes of discussion we may assume that it is a one-man business and that it is organized at the optimum size. It will be recalled that £800 was put into the business and that, at the end of a unit period of a week this capital had grown to £806: £6 we called profit.

From what we have said subsequently, it is clear that this profit of £6 is "gross profit" and that if we are to consider the "net profit" we shall need to deduct from it that which could have been obtained by investing the capital elsewhere. If we suppose this to be £3 we are left with a "net profit" of £3. It will be further recalled, however, that we showed that profit was the difference between "inflow" and "outgo", but by altering the amount of profit from £6 to £3 we have, apparently, disturbed this equality. We have, in effect, increased the "outgo" by the amount of profit that could have been otherwise made.

This analysis of profit would seem to have landed us in a paradoxical position. We have defined profit as the increase of capital value in a unit period of time and we have shown that this increase is also the difference between inflow and outgo during that same period. We have, however, arrived at the point at which

we see that it is possible to reckon outgo in two ways: we may include or exclude the amount of money that might have been earned by the capital in other ways. Is it possible to resolve the paradox?

It will be recalled that when we were, before, demonstrating the mode of calculating profit we took as the two valuations, that at the point of input and that at the point of output—we took, so to speak, since our period was a week, 1st January to 7th January. This gave us in the illustrative case £800 and £806. If, however, we take as our period that between one point of input and the next, 1st January to 8th January, say, then the figures become £800 and £803 respectively, the £3 “interest” having been paid out. This involves our ceasing to think of Kayell as a man of flesh and blood only; we have to think of him as possessing an *alter ego* who is the business, borrowing the money from the real man. If we think in this way we see that on 1st January the *alter ego* has £800 at his disposal and on 8th January he has £800 at his disposal *plus* the £3 net profit. Kayell, flesh and blood, reckons his profit as £6; Kayell, *alter ego*, reckons it at £3. In other words, Kayell, flesh and blood, reckons his returns as “interest plus particular investment return” and Kayell, *alter ego*, reckons it as “particular investment return” only. The *alter ego* is the “entrepreneur” in economic terminology.<sup>1</sup>

For the purposes of our present discussion we need not enter into the consideration of which, if either, of these two returns should be regarded as profit; all that we are concerned with is the consideration of what fixes the limit to the amount of capital that is employed in a business and this has already been made clear, though there are two ways of stating the condition. A business tends to draw to itself so much capital that the marginal yield is equal to the yield in alternative investment—the rate of interest—or the “particular investment return” on the marginal investment is zero. If Kayell is the sole owner of his business employing £800 to the maximum advantage, then the 800th pound yields a rate of profit (gross) equal to the rate of interest at which he could invest it elsewhere or it yields a net profit or “particular investment return” of nothing. In either case £800 is the capital employed and the object is to employ it so that the maximum “particular investment return” is obtained.

<sup>1</sup> “The controlling interest of a firm is an *entrepreneur*” (Joan Robinson, *Economics of Imperfect Competition*, p. 17). This is the only use that we can make of the term “entrepreneur”; it denotes the *persona ficta* of corporation law. The function of the entrepreneur, as an *alter ego*, is that of the *ego* of the individual. It “sees” what can be done with the firm’s (or individual’s) property and “orders the best”.

Having defined the condition that must hold when a business has absorbed the optimum amount of capital (assuming the optimum amount to be that which produces the maximum "particular investment return"), there remains for consideration the question of whether there is an optimum amount for every business towards which it tends to move. Is there, in short, in every business an amount of capital more than which the business cannot employ to advantage and less than which involves capital not being used to maximum advantage?

Our discussion hitherto has assumed that there is such an optimum amount but, in actual fact, the matter is still under consideration by economists. The outcome of their investigation being uncertain nothing more than a provisional answer can be given here. The opinion of the present writer is that we can assume, at any given moment, that there is, within the price structure and pricing conditions, such a limit for every business.

If there is no limit to the amount of capital that can be put into any particular business it follows that it is conceivable that all other uses of money can be suspended and the whole of it, within present pricing conditions, can be applied to investment. Such a possibility is, on the face of it, absurd. There must, of necessity, be a certain amount of money devoted to present consumption needs. No investment can offer a reward sufficient to induce all money to be supplied to it, nor can all investment opportunities together be so attractive; the present price scheme must of necessity be such that the price that needs to be offered for all money is higher than any business—or all businesses together—can afford to give<sup>1</sup>.

If the possibility of unlimited expansion exists anywhere in the world of business enterprise it can only exist at one point or in one business. Unlimited expansion implies expansion of trade and it is quite clear that all the trade of the world cannot be controlled by each of several businesses. They may share the trade but they cannot, every one of them, have the whole of it. Thus, the suggestion of unlimited employment of capital being anywhere possible is a suggestion that the present exchange system is an incipient monopoly: there is, of course, an optimum capital investment for every existing business but the optimum is zero in all cases but

<sup>1</sup> This is the position, of course, assuming that money which is turned into investment is saved from other modes of employment. The argument will not hold if some investing body has power to create new money without withdrawing it from elsewhere and exercises this power. We are, however, considering a normal exchange system here, the effects of inflationary action are dealt with elsewhere.

one, and indefinite in that This implication is accepted by many writers who express the opinion that free enterprise leads ultimately to a complete, all comprehending monopoly

To substantiate their claim, those who hold this theory usually rely partly upon another theory and partly upon a certain amount of what they regard as confirmatory evidence drawn from observation of facts. The theory upon which they depend is that which claims that the larger the scale of operation the lower the average costs of production and, therefore, the greater the power of expansion The facts upon which they rely are the cases of increasing monopolistic control that are to be found in the system.

With regard to the theory of the economies of large scale production we have already said something in the chapter dealing with the physical aspect of internal administration We have shown (*a*) that it is impossible to make a total of the physical resources employed in any act of production and, in the case of multiple products it is impossible to make a total of these also, hence in such a case, no law can be formulated regarding the relationship between total input and total output; (*b*) that with respect to a single product it is likely that, as the amount produced is increased indefinitely, the production organization will fall into complete production units owing to physical limitations this would suggest that, in some cases, at least, there is no reason to expect amalgamation.

The "laws" of physical returns have, however, no ultimate significance for a business man. As we pointed out in the chapter dealing with them, there is really no such thing as a technical optimum; judgments concerning the advisability of certain investments are judgments involving valuation Because, by increasing the quantity of any given factor (physically) the physical product can be increased in greater proportion, this is no reason for concluding that the investment should take place, it is no reason for suggesting that the average cost of production will be reduced Before any statement regarding advisability is made, the prices of resources employed and the prices of the products before and after the increase is made, must be known It is possible for a business operating under increasing physical returns to be operating under diminishing financial returns because of the changes in the prices of resources and products brought about by the increase of output and increase of factors employed Business administration is primarily the administration of money values To prove that there is a tendency at any given moment towards monopoly, it is necessary to prove that some particular business can expand continuously within the given price scheme, always able to offer

financial rewards to induce money, materials, and labour to give it their services to a greater and greater extent.

The evidence of observed facts is equally unsatisfactory. There is no doubt that at many points in the exchange system there has been a development of larger scale organization involving the employment of larger quantities of capital but alongside this development there has been a remarkable persistence of the smaller unit. The fact that the all embracing monopoly has not yet developed is not, of course, proof that at any moment such an organization does not lie implicit in present conditions. Time brings changes in the nature and distribution of resources and so, in all probability, changes the unit which could so develop. It may be that the growth of the company or corporation organization (especially financial organization) will make for the greater and greater sizes of business units, but even a vast extension of large scale organization with a large number of monopolies does not prove that the ultimate goal of development is a single unit.

It is certain that any business producing a single product must have a limit to its possible expansion, for there is a point of saturation in the market for every single product: man cannot live on bread alone or any other thing. Single product businesses must, ultimately, meet increasing costs of factors and falling sales prices if their productions are increased indefinitely. If any business could be conceived as indefinitely expansile it would need to be a multiple product business, a business providing every conceivable product. The simple realization of this fact seems sufficient to assure us that the idea of a single all comprehending business is but a speculative toy.

The resources which men employ are so multifarious and so widely dispersed in distance, the market is so widely dispersed, the knowledge required to conduct modern productive and sales organizations so extensive and necessarily so highly specialized, men vary so much in general and specialized abilities that, regardless of the changes that time brings, it is very unlikely that at any given moment, given a halt to changes in basic data—a halt in invention and changes in modes of living—any business could be conceived in supreme control.<sup>1</sup>

There is another particular reason which the present writer considers justifies his claim that business units can be regarded as, in the present scheme, tending towards their optimum capital utilization and that many may exist in equilibrium simultaneously. We speak of business operating within a given price scheme and

<sup>1</sup> See Robinson, E. A. G., *The Structure of Competitive Industry*, especially chapters iv, v, vi.

we assume that the price scheme is known. When we speak of the price scheme within which men operate their businesses "being known" we mean, really, that men operate within "known prices". There is, however, a wide difference between the "price scheme being known" and the "known price scheme". If it were true that there lies in the present circumstances the possibility of one monopoly of all trading, the prices which would rule under that organization would doubtless be vastly different from the prices with which we now work. When business men say that they know the prices with which they operate they mean that they know them more or less; they do not claim to know what they would be if there were revolutionary changes in the organization. We speak of the daring of speculators in trade and industry but compared with the daring that would be necessary for the attempt at such a vast reorganization as we are here considering their most reckless courage is timidity. It is sometimes said that large organizations can borrow more cheaply than small organizations, in some cases this is true, but there is a limit to the size of the loan which any business can effect. Capital is borrowed and lent within a circle of uncertainty. Technical organization possibilities may be vast, there may be great possibilities of all round increases in well-being. There is little possibility, however, of our knowing what prices would be if these great changes were made. Uncertainty acts as a sort of buffer against which economic organization impinges: it limits the possibilities of investment and sends up the price of lending against all businesses when loans reach a certain size. It is impossible to discover the business which might have technical possibilities of being the great monopolist.

We return, therefore, to our assumption. At any given moment a business tends to grow or shrink in the amount of capital it employs, moving towards an optimum amount. The optimum amount of capital employed is characterized by the gross profit on the marginal unit of capital being equal to its earning capacity in some other investment, allowance being made for uncertainty.

It will be realized that this discussion has been a discussion of the "laws of returns" from the financial point of view. We have been considering the relationship between the size of financial input (capital employed) and the size of financial output (value of product). We have seen that since both quantities are measured in terms of money value there arises a possibility of there being a "net output" or difference between them. This difference between input and output has no conceivable meaning physically. It will be useful at this juncture to give a diagrammatic representation of the "course of returns" as the present writer considers it most



probably exists and, along with it, by showing the alternative yield as "reserve prices", show the limit to which a business may grow. This diagram is given as Diagram AA.

The increments of capital employed are represented on the horizontal scale OX. On the scale OY are measured the "gross profits" earned on these increments of capital and the prices that can be obtained for lending them elsewhere. The curve OLMN is the profits curve and the curve IT is the borrowing price curve—alternative yield or "interest curve".

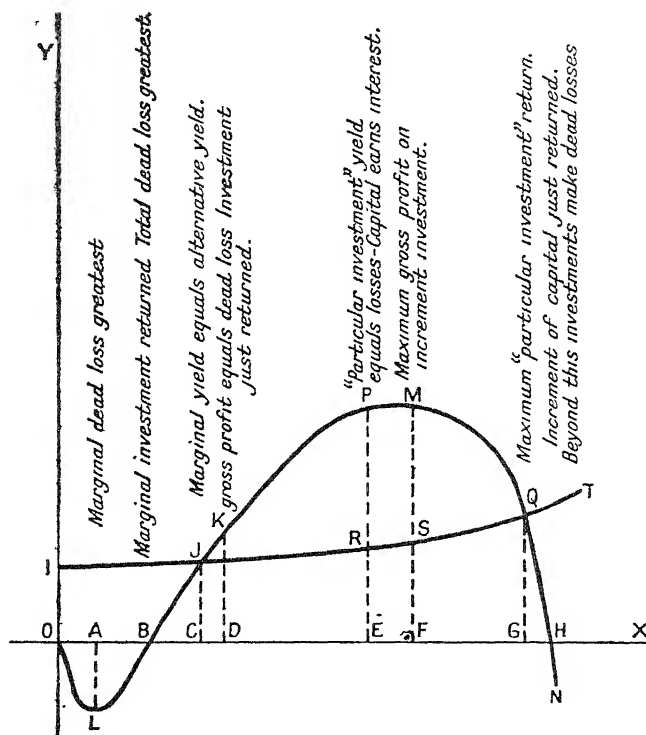


DIAGRAM AA

It will be seen that the curve OLMN dips below the axis OX for a time; this is intended to show that in many cases at least there is a scale of investment below which not only will no profit be made but the capital itself will dwindle. For example, it is obviously impossible to think of a colliery business employing a £100 of capital: it would be money thrown away. From O to OA the capitals employed are shown as increasing in losses; from A to B the increments of loss dwindle: thus capitals of less than OB are invested at a loss. When the increments

of capital have raised the amount to OD it will be seen that the profit BKD is just about equal to the loss OLB so we may say that OD represents an amount of capital invested which is just returned. There is, however, at OD, no surplus and, if we regard the price that has to be paid to induce its investment as indicated by the line IT, it is clear that there is a loss. It is not till the capital invested is OE that we have a profit that is of sufficient size to pay for this lost opportunity in other investments. The area JPR is equal to the area IOLJ. Any total investment less than OE gives a negative "particular investment return" and is, therefore, not likely to be undertaken deliberately.

All increments of capital beyond OE and as far as OG give returns greater than the alternative yields indicated by the curve IT so we may expect capital to flow in to this amount. The "net profit" or yield of profit over and above alternative possible yield is shown as increasing as far as FM (where the "net profit" equals MS), and then it dwindles to a magnitude indicated as QG. OG is the optimum amount of capital that can be invested in this particular business and the area RPQ represents the "particular investment return". Beyond OG as far as OH a "gross profit" is made, but the alternative yield being greater it represents a negative particular investment return beyond OH the increments of capital even are not returned.

The curve IT is shown as starting at a positive rate this is because we assume that there is an alternative use for all money that goes into this or any other particular business. The shape of the curve is intended to show that though for a considerable distance capital may be borrowed at a uniform rate, beyond a certain point it will rise. This is because no business can command at any given moment an unlimited amount of capital sooner or later the borrowing price of capital will rise. The upward bend of the curve IT represents then—if nothing else in the way of possible yields—the influence of uncertainty on the supply of capital.

The particular shapes of these curves will, of course, vary from business to business. For instance, they may be such as to make the particular investment return zero, in this case capital would be earning a profit equal to alternative use, but no more, and the minimum size of profitable business investment and the optimum size would be equal. Further, the curve IT might intersect the curve OLMN when this latter curve is rising, that is, the price scheme might be such as to make possible a larger gross yield per increment of capital, but uncertainty might be such as to deter investors. In this latter case the particular investment return might be zero or more. Such curves are shown in Diagram BB.

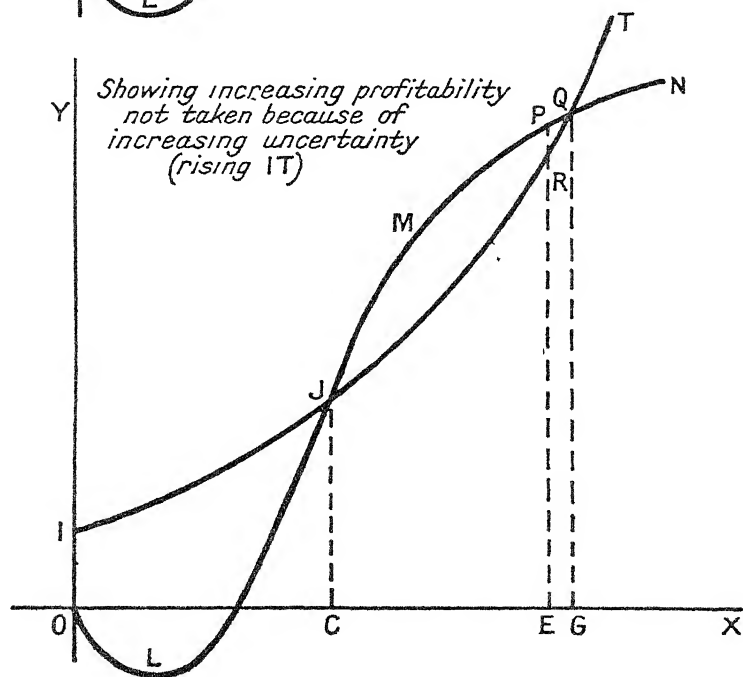
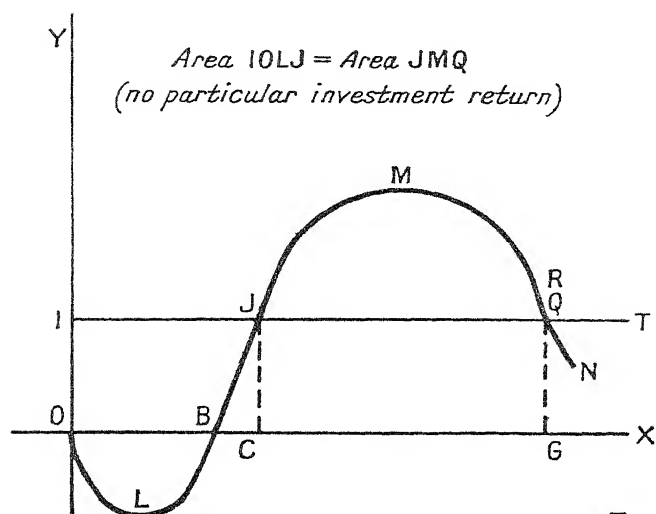


DIAGRAM BB

Having stated the condition that determines the amount of money that will be invested in any particular undertaking we have now to turn our attention to the consideration of what determines the "shape" of the investment pattern or the pattern of capital allocation within the business. Earlier in this chapter we gave an imaginary allocation of Kayell's £800 amongst buildings, machines, raw materials, labour, heat, light, and power. Our problem then is

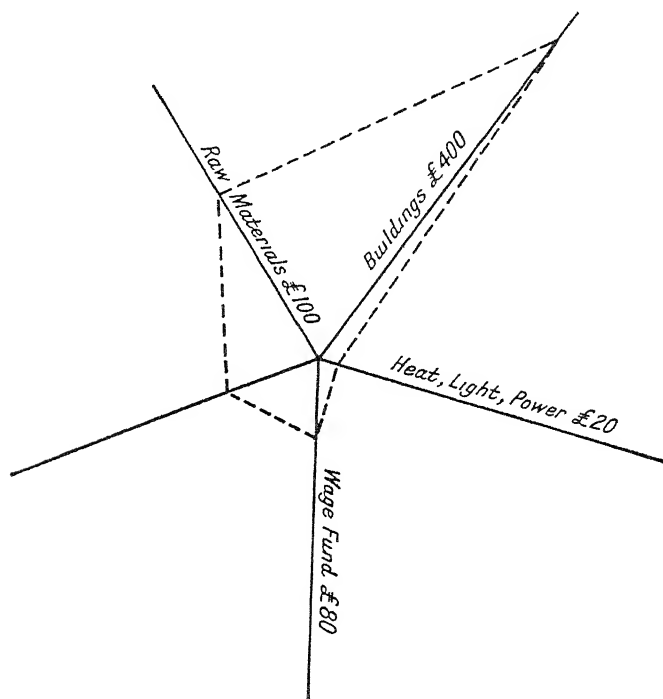


DIAGRAM CC

to consider the conditions which make this allocation the best, assuming it is the best.

The best allocation of Kayell's £800 is that which leads to a result that is worth the maximum amount of money : the input of £800 is then so allocated that the output is £800 plus the maximum profit. Diagram CC gives the pattern using the figures employed before.

The first thing to note is that we are regarding as input the whole £800 of money capital and, as output, the value of the assets

at the end of a week. Thus we are regarding £100 as spent on buildings *for a week*, £200 on machines *for a week*, £100 on raw materials, £80 on wages, £20 on heat, light, and power *for a week*. Some of these payments are purchase prices for things that last more than a week and some of them are rent payments, but it does not mean that we are overestimating input on this account. The product which we are valuing includes impaired buildings, impaired machines and boots, so that what seems to be "over-valuing" of input is corrected by what seems to be overvaluing of products. In the illustrative example we made this product consist of £398 worth of buildings, £198 worth of machinery, and £210 worth of boots, £806 in all.

We are studying the principles of internal administration and, therefore, we are justified in taking the price scheme for granted: thus it does not matter whether the allocations of money capital are made on the purchase of durable equipment or of perishable services. All that matters is that we reckon as input all that is allocated and as output all that is the outcome of the internal administration or the value of the assets at the end of the unit period of time.

If this particular allocation is not the best, then it follows that a better one can be made and the making of a better pattern implies that substitution of one allocation for another is possible. Our problem, then, is comparable with that which we studied in the previous chapter, where we considered the relationship between physical input and physical output, when means were limited in the sense that we could only increase the quantity of one resource at the expense of another. Here, the means consist of £800 and they are allocated in a certain way, the only way of altering the allocation is by transferring an amount of capital from one line to another.

The allocation in Diagram CC gives by no means a full representation of substitution possibilities. It shows but five lines of allocation for the week and changes in the proportions of these mean that money may be transferred from heat, power, light, to machines, say, or buildings, in the *purchase* of larger or better ones. It does not show, for example, that money may be transferred from the purchase of machines to the hire of machines and yet this kind of substitution is very common in business life. In this case, it might pay Kayell to transfer £300 from buildings, spending £100 on the hire of larger and better buildings and using the other £200 for the purchase of more raw materials and the hire of more and better labour. As we said above, it does not matter whether the capital is allocated to purchase or hire.

Now it is clear that we can apply the technique of thinking

which we employed in the last chapter and state that the condition of the maximum product value issuing from the employment of £800 capital is, assuming infinitesimal adjustments to be possible, that the marginal yield of the money in one allocation is equal to the marginal yield of the allocation in all other directions. Thus, the 20th pound (or the 400th shilling) spent on heat, light, and power equals in yield the 400th pound (or 8,000th shilling) spent on buildings and the 200th pound (or 4,000th shilling) spent on machines, and so on, round the scheme of allocation. This is a mathematical necessity.

In the last chapter we employed the conception of "marginal substitution price". By this was meant the amount of one resource that had to be given up in order that another could be increased by a tiny amount. In our present case the marginal substitution price is unity, or 1s for 1s, £ per £, and so on, because we are dealing with allocations of identical resources—money—in different ways. Since the marginal substitution price is unity in every case it follows that marginal productivities of money in all directions must be equal when the maximum value is produced, assuming that very fine adjustments can be made in the proportions of physical resources employed. If these marginal productivities were not equal it is obvious that it would pay to transfer a unit of money from one allocation to another.

If we assume for the moment that the equality of marginal productivities of all money allocations is attainable, it will be seen that we can combine the consideration of the shape and size of money investment in a business. Suppose, for example, that the alternative yield on the investment of a pound is 4 per cent. we have seen in our previous discussion that a business tends to such magnitude of investment that its own marginal yield is 4 per cent. We now see, that if this business is organized so that it produces the maximum "particular investment return", the marginal yields of all allocations are equal. These marginal yields must themselves, then, be equal to the borrowing price of more capital. Thus we can frame a generalization concerning the magnitude and scheme of capital in any particular business investment.

*The capital invested in a business tends to grow to such a magnitude that the marginal gross profit equals the yield that it can acquire in some alternative use (ordinarily the current rate of interest) and it tends to be so allocated that the marginal profit in each allocation is equal to this same rate of alternative yield.*

In the example taken above, assuming the infinitesimal adjustment to be possible, and assuming the alternative yield to be 4 per cent, it follows that Kayell is earning 4 per cent on his marginal unit of

the £800 of capital and, also, he is making 4 per cent on his marginal unit of the £400 on buildings, £200 on machines, £80 on labour and so on. If he were making more than 4 per cent on the marginal unit of his total investment or on the individual allocations there would be a tendency for more capital to be employed; if he were making less, there would be a tendency for capital to be withdrawn unless it were a case of a larger amount of capital carrying the business over the zone of low returns to the zone of higher returns.

The discussion so far has been of the nature of an amplification of a mathematical truism. If infinitesimally small adjustments of capital allocation can be effected, it is obvious that the optimum scheme of allocations is that which gives equality of marginal yields on all allocations. It should be observed, however, that an optimum organization is possible even if marginal yields are not equal.

In the last chapter, it will be remembered, that when we were considering the effects of substitution the productivities which we regarded as comparable were the productivities of substitutable quantities. Thus, if we regard a pound as the least amount of money which can be transferred from one line of allocation to another the substitution quantities of real resources whose productivities we compare are the quantities of the two resources that can be acquired for one pound. More accurately, starting from a given allocation, the quantities are (*a*) that which can be bought for one pound in one direction and (*b*) that which can be sold in another to provide the wherewithal to buy the substitute. Thus the quantities to be compared are the marginal productivity of the money spent on one factor and the extra-marginal productivity of the money spent on another factor.

Suppose, for example, an allocation exists of £100 on resource A and £50 on resource B. If substitution is to be considered, the productivity of the 101st pound of A will be compared with the productivity of the 50th on B, of the 102nd on A with the 49th on B and so on; or, alternatively, the 51st on B with the 100th on A and the 52nd on B with the 99th on A.

Now, so long as the marginal expenditure on A is more productive than the extra-marginal expenditure on B (or is, at least, equal to it), and the marginal expenditure on B is more productive than (or equal to) the extra-marginal productivity of expenditure on A, there will be no change of allocation. (Even when infinitesimally small adjustments can be made so that the differences between productivities of marginal and extra-marginal units of expenditure can be neglected—the basis of the marginal theory—it is this condition that causes no substitution of large quantities to take

place. It is quite possible and, indeed, quite common, that when a business is so organized that the transference of a pound of capital from one allocation to another makes no difference to the product value, the transference of, say, £100 between two allocations in either direction would cause a decline in product value)<sup>1</sup>

This relationship can be best explained if we consider, first, the expenditure or allocation of money on two resources only, A and B. We have shown above that the optimum adjustment between the two allocations is reached when the smallest amount of money that can be transferred from one resource to the other either reduces the total value productivity or leaves it unaffected. If we call this smallest amount of money  $m$  this means that the productivity of  $m$  units worth of A is equal to or greater than the productivity of an additional  $m$  units worth of B and the productivity of  $m$  units worth of B is greater than or equal to an additional  $m$  units worth of A.

Let us call the amount of A which can be sold for  $m$  units of money  $a$  and the amount of B that can be sold for the same amount of money  $b$ , and let us further call the amount of A which can be bought for  $m$  units of money  $a_1$  and the amount of B,  $b_1$ . It follows then, that we can call the prices of these quantities

$\frac{m}{a}$ ,  $\frac{m}{b}$ ,  $\frac{m}{a_1}$ , and  $\frac{m}{b_1}$  respectively, and these we may symbolize as

$p_a, p_b, p_{a1}, p_{b1}$ , the symbol  $p$  representing price.

If we call the productivities of these quantities of the two resources "d" we may symbolize the average productivities of these small quantities as  $d_a, d_b, d_{a1}, d_{b1}$ , respectively.

Now, in the first place, we must note the following relationships.—  
 $m = a \times p_a = b \times p_b = a_1 \times p_{a1} = b_1 \times p_{b1}$  and from these the following relationships are derived.—

$$(i) \frac{a}{b_1} = \frac{p_{b1}}{p_a}, \quad (ii) \frac{b}{a_1} = \frac{p_{a1}}{p_b} \quad . \quad (1)$$

In the second place, assuming the optimum to be attained, we have these relationships.—

$$(i) a \times d_a \geq b_1 \times d_{b1}; \quad (ii) b \times d_b \geq a_1 \times d_{a1},$$

and from these there follow:—

<sup>1</sup> It should be noted that a stable position can be attained in the size of investment made in a business without the marginal yield of capital being equal to the alternative yield of the marginal unit, for the same reason as that given for the stability of allocations of capital within a business. The final unit of capital actually employed may yield a return greater than could be obtained elsewhere and the unit beyond this might yield a return that is less. There is thus no tendency to change within the given price scheme.



$$(i) \frac{a}{b_1} \geq \frac{d_{b1}}{d_a}, \quad (ii) \frac{b}{a_1} \geq \frac{d_{a1}}{d_b} \quad . \quad . \quad . \quad (2)$$

Using both relationships (1) and (2) we have —

$$(i) \frac{a}{b_1} = \frac{p_{b1}}{p_a} \geq \frac{d_{b1}}{d_a}; \quad (ii) \frac{b}{a_1} = \frac{p_{a1}}{p_b} \geq \frac{d_{a1}}{d_b}$$

Thus we see that when capital is optimally allocated between A and B the ratio of the prices of the quantities which can be substituted by the smallest transference of capital possible (i.e.  $b_1$  substituted for  $a$ , or  $a_1$  for  $b$  equal in each case to  $m$ 's worth) is either equal to or greater than the ratio of their average productivities

When adjustments can be made of infinitesimally small quantities of money and real resources the above relationships may be expressed in ordinary marginalist terminology. In this case  $a = a_1$ ,  $b = b_1$ , the average prices of  $a$ ,  $a_1$ ,  $b$ ,  $b_1$ , units are equal to the respective marginal prices, and average productivities of these amounts are equal to marginal productivities. Thus

$$\frac{a}{b_1} = \frac{a}{b} = \frac{p_b}{p_a} = \frac{d_b}{d_a};$$

the ratios of marginal prices and marginal productivities are equal.

If the adjustments cannot be made in infinitesimally small quantities, but the substitutable quantities can be measured in a number of units, then the relationships are as stated above. If the substitutable quantities are incapable of measurement in units then they must each be reckoned as unity—that is  $a$ ,  $a_1$ ,  $b$ ,  $b_1$ , must be treated as single units.

In some cases it may be that the money released by the sale of the smallest quantity of one resource may be more than is necessary to buy one unit of the other but less than sufficient for two: substitution by the “cheaper” for the more expensive thus leaves a surplus amount of money and this must be reckoned as product. For instance, if the smallest sale of A yields 5s and it is only possible to spend 4s or 8s on extra B it is clear that 1s. will be left over. The 5s transferred will produce a certain amount of product value plus the shilling, the productivity of the 5s. transferred must be reckoned as including the 1s. so left in hand.

Before leaving this part of our discussion we must recall a relationship between the input and output at the margin (or at the point as near as possible to the margin to which the resources may be administered) to which we referred earlier. We are dealing here with the internal administration of resources and, therefore, we

are dealing with the investment of money in a particular business concern. The capital that is invested may have alternative uses and, therefore, it follows that the marginal productivity of the capital invested in this business—or the final smallest unit of money that can be employed or not employed—must at least equal the unit of money plus what can be earned in the best other direction. If we regard this as the interest that can be earned in the market, it follows that the marginal productivities of all allocations must be equal to the marginal allocation  $\times (1 + \text{the rate of interest})$ . If infinitesimally small adjustments cannot be made then the net yield of the smallest amount of transferable money must be at least equal to the rate of interest but it may be higher; it will not be less.

Having now indicated the conditions determining the optimum investment of capital in a business and the optimum allocation of this capital in various resources we must proceed to say something with respect to the sensitiveness of such investments and allocations to changes in economic data.

All changes in the data on which businesses operate are reflected in changes of prices which are paid for resources or received from sales. The investigation of the sensitiveness of the size and mode of allocation of the capital of a business is, then, an investigation into the relations between changes of prices and changes of capital employed, the total capital in any business or the distribution of capital to various resources. Such sensitivenesses to change of data are known as elasticities, so our discussion is concerned with the *elasticities of capital employment* in relation to certain price changes.

Now it is important to realize that all prices and quantities of money capital and real resources in the economic system are related and, theoretically, any change that takes place in any ratio of exchange or quantity of resources employed at any point in the system has effects on all other prices and quantities no matter how distant in space, time, or structural proximity. The effects may be slight—may even be zero—or great, but theoretically they must be regarded as produced everywhere. From this it follows that the number of relationships that might be considered is legion, and in the practical affairs of business they are.

It is necessary in scientific work, however, to establish chains of ratios, lines along which stimuli travel, in order that the patterns of related changes may be appreciated. Only in this way can the mass of changes be seen as a pattern of related quantities at all.

Before proceeding to the consideration of the various conceptions of elasticity which economists employ it is necessary to make a

further observation. When any change in economic data takes place, the reactions take time to work themselves out and, before final equilibrium can be established, there are various unstable intermediate situations established. Sometimes, in the short period, the reactions which business men make are in the opposite direction to the movements they will have made when the whole system has had time to settle down. Here we shall consider only the long period changes, the changes from one equilibrium to another.

The first relationship to which attention must be directed is that between the change in the amount of capital a firm employs and the change in the rate of interest. We have already made clear that the optimum employment of capital is determined by the equalization of the marginal earnings of capital and the rate at which money can be borrowed. If, therefore, this rate changes it is expected that the optimum amount to be employed will change and the ratio between the change in this optimum amount and the change in the price of borrowing is a measure of the *elasticity of demand* for capital of this firm.

It should be noted that the change in the rate at which money may be borrowed may be a general change of the rate at which all businesses may borrow or it may be a change in the rate at which this particular business may borrow.

The change of data may be a change in the confidence reposed in all firms or it may be a change in the confidence reposed in the particular firm, the confidence in others firms remaining as it was. In the latter case it may be said that a fall in the price of borrowing will normally bring about an increase in the amount of capital employed and the common market rule that a rise of prices causes a fall of demand and a fall of price causes an increase in demand applies.

In the former case, however, this statement cannot be made with the same assurance. Changes in the general rate of interest have general and profound changes in the price structure and when a new equilibrium is established it may be found that the particular firm we are considering has a lower optimum capacity if the price of capital falls and a higher optimum if the price of capital rises. That is, the optimum may move in the same direction as the price of capital or in the opposite direction: the elasticity of demand for capital may be negative or positive.

Mathematically, the elasticity of demand should be regarded as positive when the change of demand for and the change of price of capital are in the same direction and negative when they are in opposite directions but since the general rule in the market is for

demand to fall as price rises, this is taken as normal and, by convention, regarded as positive

The formula for elasticity of demand for capital (elasticity of expansion) is, then .

$$- \frac{\text{Percentage change in capital employed}}{\text{Percentage change of rate of interest}}$$

or

$$- \frac{\frac{\text{New optimum capital} - \text{Old optimum capital}}{\text{Old optimum}}}{\frac{\text{New rate of interest} - \text{Old rate of interest}}{\text{Old rate}}}$$

We must now proceed a stage further in our analysis. Not only will there, most probably, be a change in the optimum amount of capital employed in the business altogether, but in each particular allocation of capital there will also be a change. The difference in scale of operation brought about by the change of interest rate will make a difference in the optimum quantities of particular resources employed and the changes in these particular allocations will not be equal. There is, then, a "set" of elasticities of demand for capital for the "set" of resources employed.

The variety of elasticities of demand for capital allocated to specific resources within the business implies that, with a change of interest, there is a change of pattern of production and a change of pattern implies a process of substitution. Substitution being a change in the relative quantities of resources employed, it is clear that, as between any two allocations, a measure of the amount of substitution may be obtained by calculating the change in the ratio of quantities of capital employed in these two ways. By relating this change of ratio to the change of interest we have a measure of the *elasticity of substitution*. Its relation to the elasticities of demand for particular capital employments is obvious. Given the original quantities of capital employed the new quantities employed under the influence of a change of interest rate can be easily calculated with the aid of the elasticities of demand and, hence, the elasticity of substitution may be calculated.

The formula for the elasticity of substitution as here understood is as follows —

$$\frac{\frac{C_a^1}{C_b^1} - \frac{C_a}{C_b}}{\frac{C_a}{C_b}} \bigg/ \frac{I^1 - I}{I}$$

where  $C_a$  and  $C_b$  are the original amounts of capital locked up in resources A and B and  $C_a^1$  and  $C_b^1$  are the new amounts when  $I$ , the original rate of interest, is changed to  $I^1$ , the new rate

Before we leave the examination of the relationship between the change in the quantity of capital employed in a business, either as a whole or in particular applications, and the rate of interest, we may digress for a moment, to show how the coefficient of elasticity of substitution may throw light on the allocations of capital to different businesses. The distribution of capital amongst various businesses may be regarded as analogous to the distribution of the total capital of a particular business amongst its various resources. When the rate of interest at which all businesses may borrow is changed it is certain that the elasticities of demand for capital will not be found equal. Any variety, therefore, involves a change in the relative amounts of capital required, a change in the "pattern of optima". The ratio between the change in the relative amounts of capital employed by any two firms to the change in the rate of interest is a measure of substitution between these firms. The formula given above for the elasticity of substitution between two resources A and B is the formula to be employed here, A and B in this case being two firms instead of two resources.

We may now turn our attention to the sensitiveness of the capital amounts and patterns of allocation to changes in other prices, the prices of resources. If the price of a single resource, say land, machinery, labour or other raw material, changes, it is obvious that some readjustment must take place. If the change should be an increase the immediate effect is a certain restriction of activity, but in the long period when the new equilibrium is established, there may be a restriction or an expansion: it is unlikely that there will be no change in the optimum of capital required to run the business. As in the case of a change in the price of money, so in this case there will be some effect on the capital requirements of the business as a whole.

There is a difference, however, between this relationship and that involving the rate of interest or price of money capital. It cannot be said, for instance, that a change in the price which must be paid for land affects the total amount of capital employed in the business only by the amount by which the capital locked up in land changes. There are associated changes, changes in the amounts of capital locked up in other resources.

The variation in the amount of capital locked up in land consequent on a change in the price of land may be cited as an ordinary case of elasticity of demand for capital, but it is clear that the change in demand for capital on this account will be generally associated

with a change in demand for capital in other employments. These changes in the capital allocations may be regarded as secondary or later reactions to the initial disturbance, nevertheless it is a kind of elasticity though it may be better to consider the relationship simply as a correlated change.

Hitherto we have only considered elasticities in reference to single price changes. In the case of elasticity of demand this is the only possibility, but in the case of substitutability it is possible to relate a change in the relative amounts of capital employed to a change in the relative prices of the two resources concerned. Thus, if, when the prices of the resources are in the ratio of  $\frac{3}{4}$ , the capitals employed in respect of them are in the ratio of  $\frac{3}{5}$  but when, owing to a price change, the ratio of prices is  $\frac{3}{2}$  and there is a change in the ratio of capitals to  $\frac{4}{5}$ , the elasticity of substitution is the ratio of the change of the capital ratio from  $\frac{3}{5}$  to  $\frac{4}{5}$  to the change of price ratio from  $\frac{3}{4}$  to  $\frac{3}{2}$ . That is, the amount of substitution is the change in the ratio of allocations divided by the original ratio of allocations. The coefficient of elasticity of substitution is the ratio between this "amount of substitution" and the change in the relative prices of the resources.

If we designate the capitals allocated to A and B,  $C_a$  and  $C_b$ , and the prices of A and B,  $P_a$  and  $P_b$ , respectively, we can express the coefficient of capital substitution elasticity as

$$\frac{\text{Change of } \frac{C_a}{C_b}}{\frac{C_a}{C_b}} \div \frac{\text{Change of } \frac{P_a}{P_b}}{\frac{P_a}{P_b}}$$

Scientific examination of the implications of this conception has not proceeded very far as yet and the little that has been investigated is confined to its implications in a set of carefully defined circumstances. Some critics wonder if the concept will ever be of any use in analytical work<sup>1</sup>: they wonder if it will ever be more than a mode of posing a problem. As we hinted above, it possibly never will be more than this, but in a general work such as this it seems definitely useful to state the problem in this way.

There are several reasons which make the conception of elasticity of capital substitution valuable to students of economics, whether it is ever capable of mathematical expression and calculation in all its forms or not. The two chief reasons are as follows: in the first place, to grasp the conception is to

<sup>1</sup> Pigou, A. C., "Elasticity of Substitution," *Econ Journal*, 1934.

grasp the idea of the economic system as a social system or a social pattern, a distribution of resources in place and time determined by all who take part in the buying and selling of things and the use of money. In the second place, its comprehension means a comprehension of the fact that the optimal size of investment and the optimal mode of allocation lie implicit in the physical, psychical and price data of the time. Men vary in foresight, knowledge, and courage, but the sizes of the enterprises upon which they enter are determined by other factors besides these. In a certain sense, an understanding of the elasticity of substitution lowers the prestige of the entrepreneur of neo-Classical theory by showing that he is one who sees an opportunity rather than one who makes it. This takes away some of the glory from some of those who become "captains of industry" but adds to the glory of some of those who remain "privates" and "sergeants". There are some men who will miss the "golden" opportunities, but there are others who perhaps can never see more than "copper" ones. In other words, the optimum size of some businesses, lying implicit in the system, is small, and of others it is large. It is difficult to conceive a medical practitioner with a business as large, say, as a railway company!

Having discussed the capital aspect of the internal administration of a business we must now turn our attention to what we called above, the "outgo and income" aspect. So far we have treated the input of a business as the whole of its capital assets at a moment, and its output as the whole of its capital assets at the next moment, describing the difference between them as gross profit (or loss). Thus our conception has been of a flow of capital value through time, the stream widening and narrowing as it gathered profit and poured it out to the owner of the business. We are now to consider the streams flowing into and out of a reservoir.

It will be recalled that in the example we took on page 183 we reckoned the input and output of Kayell's business as follows.—

|        | <i>Buildings.</i> | <i>Machines.</i> | <i>Heat,<br/>Power, etc</i> | <i>Raw<br/>Materials</i> | <i>Wages<br/>Fund.</i> | <i>Boots</i> | <i>Total</i> |
|--------|-------------------|------------------|-----------------------------|--------------------------|------------------------|--------------|--------------|
| Input  | 400               | 200              | 20                          | 100                      | 80                     | —            | 800          |
| Output | 398               | 198              | —                           | —                        | —                      | 210          | 806          |

It will be recalled further that we showed how Kayell might describe his position in two ways, as follows:—

- (a) An input of £800 per week produces an output of £806 or,
- (b) the depreciation and using of stock and funds (of £204) produces an appreciation of £210.

We have discussed the former of these statements and exhibited some of its implications; we have now to consider the second:

it is in the second statement that the conception of the "flow-through" and the "reservoir" are implied

The business man does not normally regard himself as selling out all his assets momentarily and reinvesting the proceeds immediately and continuously. In making up his position at the end of the year he does, as we have said, consider the changes in his capital position, but during the year, he regards himself as having made the investment and maintaining his capital by replacing what he uses out of the proceeds of what he sells. He definitely regards his work, therefore, as the regulation of the outflow of money and the inflow of money, during a period, with a view to obtaining the maximum difference

According to this mode of thinking the input is the sum of depreciations and the output is the sum of appreciations and our problem is to define the relations between this output and this input when the organization is optimal

The first point we have to note is that this output (or, valued in terms of money, the income) of the firm is, from the business man's point of view, the whole *product*. It is a common practice of economists to assume, when discussing this relationship, that this product is a single product—such as boots—and, for some theoretical purpose, this is a useful procedure, but, from our present point of view, it is essential to observe that there is no need to think of a single-product business unless we think of it, as indeed the business man does, in terms of money. That is his sole product in every case, but it may be represented, in the market, by boots and beer and bottles for all that concerns the discussion at this stage.

The second point to note is that when we speak of input and output in terms of depreciation and appreciation we are speaking of *flows* of money, *through time*, and, therefore, we must think of the input in our illustrative case above, as £204 a week and the output as £210 a week. Flows are measured as so many units of that which flows, through a unit period of time. £204 a week or £10,608 a year, £210 a week or £10,920 a year, express the input and output respectively, the gross profit being £6 a week or £312 a year.

From this it follows that the conditions of a maximum difference between input and output is that the marginal rate of input equals the marginal rate of output, this means that when the optimum organization is established it will not pay the organizers to increase their annual input flow by a pound (or whatever the smallest unit may be) since it will not increase the output by an equal amount. Again, it should be noted that marginal equivalence implies the possibility of minute adjustments. If such are not possible then



the condition of an optimum is that the extra-marginal increment in the rate of flow of input is larger than the resulting increment of revenue

It further follows that the productivities of "marginal *substitute* expenditures" in all directions are equal, assuming very small adjustments possible. This, of course, is not the same thing as the equality of marginal productivities of the expenditures in all directions since, as we have shown, a transference from one line of expenditure may cause a greater or lesser expansion of expenditure in some other direction. These marginal equalities are the conditions of an optimal adjustment.

A very important point, however, must here be observed. When we were discussing the optimal organization from the capital point of view we were able to say that capital could be transferred from one allocation to another and the total allocation would remain constant though expenditures would vary according to rates of turnover. We pointed out that transfers of expenditure could not be made, leaving total expenditures unaltered, unless capitals involved were equal in their rates of turnover. Thus changes in expenditure ("flow" input) allocation imply changes in capitals employed and these changes involve changes in interest payments.

Now, obviously, changes in interest payments, have a direct effect on the expansion of a business and they must, therefore, be brought into the scheme of expenditure and income (outgo and inflow). Interest must be regarded as an outgo. When we made the distinction between the two points of view—of Kayell, "flesh and blood" and of Kayell "*alter ego*"—it will be remembered that the *alter ego* was assumed to borrow his capital and, consequently, interest became a price for the use of the capital. The pattern of expenditures then, includes the depreciations of funds and values and the payment of interest on capital employed.

When we include interest we are presented with a conception of the outflow of money as money value "used up" and of the output as money value "produced" and the difference is what we have hitherto called net profit or "particular investment return". The marginal conditions of an optimal arrangement mentioned above must, then, include a reference to interest. The marginal increment of money value used up—flow of money input of expenditure including the amount paid in interest—is equal to (or less than) the marginal increment of money value produced or marginal revenue, and the productivities of "marginal substitute expenditures" must also be equal.

The question now arises, for what are these "flow-payments" made? In our discussion of capital allocations we said that the

money was allocated to buildings, raw materials, wages funds, etc., but in this discussion we wish to know for what the depreciations stand? The answer is that they are payments for *services*. The flow of expenditure is a flow of payments for the use of buildings, use of raw materials, use of men, use of heat, light, and power plant, use of money capital, etc. a certain number of pounds per annum means the purchase of this number of pounds' worth of services. The flow of appreciations or output (or "income") is also a flow of money representing services rendered by the business to the market

This gives us an alternative way of conceiving of the pattern of a business organization: we may consider it as a pattern of *service-flows* with a corresponding pattern of rents or *service prices*, it is alternative to the conception of a pattern of resources and capital prices.

In our discussion of the capital aspect of business patterns we made considerable use of the notion that patterns differ in size and shape and we were able to discuss the conditions of the optimum of each separately. In the discussion of the patterns of service-flows we have not quite the same freedom. We can, of course, see that patterns of service-flows and their corresponding patterns of rents do vary both in size and shape, but *by introducing interest into the scheme of expenditure we have a condition that makes a change of shape involve a change of size*. There can be no equilibrium in the shape of the pattern until there is an equilibrium in the size. This arises from the fact that in the case of capital allocations we could speak of a gross profit and a net profit in the case of the expenditure organization we can only speak of net profit, for what we considered as a product in the former case (namely, the alternative earnings of capital) is, in the latter, regarded as an outgo or expenditure. Thus, when we consider the flow aspect of business administration we are driven to say that a business tends towards an equilibrium of size and shape of expenditures that gives an equality of marginal expenditure and marginal revenue (assuming the possibility of minute adjustment).

It is this fact, that when we consider service patterns we cannot separate for treatment the size and shape of patterns, which makes us realize that the fundamental characteristic of substitution is change of proportions employed and not the transference from one line to another. As we said above, a business man in pursuing his policy of substitution in expenditure cannot transfer a pound from one line of expenditure as a pound in another because in transferring expenditures he transfers something that flows with different velocities: *all he can do is to alter the amounts of*

*expenditure in different directions* Substitution in the sense of transference is a capital conception

Remembering this, however, all that was said of the elasticity of substitution of capital allocations applies with equal truth to the changes in expenditure patterns. Changes in service prices or changes in the ratios of money to be paid for services reflect themselves in changes in the proportions of expenditures. Thus changes in rents of buildings relative to wages of labour or rents of machines, or rents (purchase prices) of raw materials, involve changes in the relative amounts of expenditure. The changes involved are such as will tend to equalize the marginal expenditures in all directions with the marginal revenues due to the marginal units of service.

The elasticity of substitution in service-patterns of business administration is an extremely useful conception in the analysis of the conditions determining differences in organization of businesses producing the same kind of service for the market, and one or two illustrations will serve to relieve the abstractions of our discussion.

In popular discussion of farming methods in America compared with those employed in this country it is very often heard that the latter are inferior to the former because they use "small scale" methods: American agriculture is praised for its employment of the big acreage. In fact, the differences in method are largely the result of price differences.

American land, particularly in the Middle West, is rented on the average at lower rates per acre than English land of equal quality in the fertility sense. On the other hand, American labour is more expensive in terms of money than English labour. Thus, disregarding differences of transport costs to market, the ratios of labour prices and land prices are different. It is to be expected then that there will be differences in service-patterns. The Americans use cheap land extensively and dear labour intensively while English farmers use dear land intensively and cheap labour extensively.

Even within the borders of England (and America, also) there are differences of like kind due to like cause. The rents of land in Lincolnshire and Norfolk are not so high as the rents of land of similar quality—distance from market again ignored—round about London and the large centres of population where housing demands are intense. The result is that larger farms (in acreage) are worked in the agricultural counties than in the suburban areas.

Recently, English agriculture has had to deal with a relative change of "rents" of labour and land, the wage changes of the post-War period being such as to make labour relatively dearer

than land service. The result is that the tendency towards more extensive land employment and less extensive (or more intensive) man employment has set in and is being called for, more and more, by those who appreciate the agricultural situation. There is value, of course, in the comparison of technical methods, but *best* methods are determined by price as well as technical conditions and sweeping generalizations that one country employs better methods than another because it works on a larger land scale are false. In both countries the same principles of administration are involved and the price schemes within which they operate give different optimum organizations.

A full understanding of the conception of service will, in fact, show that the use of the terms "extensive" employment of certain resources is fraught with a certain amount of confusion of thought. A unit of land is capable of more or less use: that is, *this piece of land is capable of more or less extensive service than that*. If the rent paid for one acre is higher than that paid for another of similar quality, it means that the average prices per unit of service yielded by these two acres vary at different rates the more services they are called upon to deliver. This change of service price has an effect on the quantity of service each unit is called upon to give; farmers, therefore, employ more or less extensively the services of particular units. More intensive use of an acre of land is really more extensive employment of the services of the land; and when *land* is used *more extensively*, the *services* of each unit of land are employed *less extensively*.

Another illustration of the importance of this conception is to be found in the conditions under which road and rail transport agencies have, until recently especially, operated. The railway companies find that a very heavy "rent" has to be paid for the use of the permanent way (in the form of large expenses of maintenance), while road transportation agencies have incurred practically no such expenses. The result of this is shown in the railways exercising great economy in the amount of track laid down while road users have been inspired by no such need. Railways have, further, tended to make the stream of traffic as dense as possible in order to reduce the amount of these permanent way costs that each unit of traffic must bear; road agencies have ignored the wear and tear of roads and have, since they were not bearing the cost of extensions, called on the public for more and more mileage. The use of large, relatively slow trains and the extensive construction of marshalling yards and tranship points are, on the railways, the direct outcome of heavy permanent way and buildings expenses; the swift small unit of the roads is, in part, the result of their having

no such costs. When the Transport Commission reported on the two modes of transport,<sup>1</sup> it criticized the railways for slowness and lack of "capillary" facilities, it criticized the roads for excessive speed, lack of traffic regulation, and irregularity of movement times. The criticisms really amounted to criticisms of railways for being railways, exercising care in the use of expensive track, and of road agencies for being road agencies not troubled with cost of track. Recent legislation, by making road transport bear more directly the burden of road maintenance, is altering the scheme of prices within which roads operate and will, no doubt, tend to more intensive use of roads. The establishment of traffic commissioners is the establishment as a public body of something that corresponds to "line control" on the railways.

We must now consider a further aspect of the money "flow-through" of a business, namely, the ratio between the outgo and inflow or its inverse. It is a most important relationship.

We said at the beginning of this chapter that a business man's objective is to make profit. We pointed out that he sells money (for his real resources) and buys money (with his real products), from his point of view, then, he buys money with money and he can only continue to do so if the ratio of what he receives to what he pays is *at least* unity. The amount of "real services" which he sells is of secondary account to him, as is the amount of real service which he buys. Service sold, from the business man's point of view, is measured by money received, and the amount of service which he buys is likewise measured by what he pays.

This being so, a business man regards the ratio of inflow to outgo in terms of money as the productivity per unit of expenditure and the ratio of outflow to inflow is the cost per unit of sales returns or income. If the productivity ratio is greater than unity the fractional excess over unity indicates how much larger on the average his pound of expenditure has become: his profit then is a fraction of his expenditure. In this case, of course, his cost ratio will be less than unity and the fractional deficiency measured from unity gives the fraction of the sales returns or income which is profit.

If the expenditure flow on services in a year is £2,000 and the sales returns are £2,200, then the productivity ratio is 2.2 to 2 (i.e. 1.1), and the cost ratio is 2 to 2.2 (i.e.  $\frac{10}{11}$ ). Thus the profit is  $\frac{1}{11}$  of £2,000 or  $\frac{1}{11}$  of £2,200, which is, in both cases, £200. It is a common practice of business men to reckon their profit on the sales and they call it the profit on turnover: it does not really matter which way the reckoning is made though it is the custom of mathematicians to regard an increase as a fraction of the quantity which is increased.

<sup>1</sup> Report of the Royal Commission on Transport, 1929.

It is obvious that the amount of profit which is made in a business does not merely depend upon the *ratio* of money inflow and money outflow, but that it also depends upon the *magnitude* of expenditure (or sales). A slight mathematical knowledge only is sufficient to make one realize that a rate of profit on turnover or expenditure may fall simultaneously with a rise in the absolute net profit. An imaginary case is given in the figures below

| <i>Expenditure</i> | <i>Sales Returns</i> | <i>Productivity Ratio</i> | <i>Rate of Profit</i> | <i>Amount of Profit.</i> |
|--------------------|----------------------|---------------------------|-----------------------|--------------------------|
| £                  | £                    |                           |                       | £                        |
| 100                | 101                  | 1.01                      | .01                   | 1                        |
| 200                | 203                  | 1.015                     | .015                  | 3                        |
| 300                | 309                  | 1.03                      | .03                   | 9                        |
| 400                | 410                  | 1.025                     | .025                  | 10                       |
| 500                | 507 5                | 1.015                     | .015                  | 7.5                      |
| 600                | 603                  | 1.005                     | .005                  | 3                        |

It will be seen that the maximum rate of profit is made when the expenditure is £300 per annum, but the maximum absolute profit is obtained on the higher scale of expenditure at £400 per annum. Diagram DD shows this case in graphical form. It is constructed with three axes, one measuring the amount of expenditure, another the rate of profit, and the third the amount of profit. The curve ABCDEF shows how the rate of profit changes as the expenditure expands and the curve GHJKLM shows how the absolute amount of profit changes with both of them. The optimum scale of business organization is shown to be where the expenditure is £400, the rate of profit  $2\frac{1}{2}$  per cent and the amount of profit £10.

We have already shown that the optimum scale of organization is that at which the marginal expenditure equals the marginal revenue (when fine adjustments can be made), giving a net profit at the margin, of zero, and now we have shown that it is the scale at which the average net profit per unit of expenditure multiplied by the number of units of expenditure is greatest. Thus we have shown that the conditions of the optimum may be stated by reference to either the marginal expenditure or average expenditure, the product in both cases being measured in value. The net product of marginal expenditure in an optimal organization is zero and the average expenditure per unit of the total revenue is such that when multiplied by the total number of units of expenditure it gives the greatest net profit on the whole venture.

We are now in a position to appreciate the significance of the relationship between inflow and outflow and understand the meaning of the various kinds of "returns" tendencies which we have discussed in other connections.

In the first place, the money "flow-through" of a business

represents in a real sense the "living" part of the organization. It represents the changes that constitute business administration in a particularly significant manner. That which does not flow through remains behind in the reservoir, so to speak, and that which is in the reservoir may be regarded as the unchanging part of the possessions of the business

In the second place we note in the money outgo what business

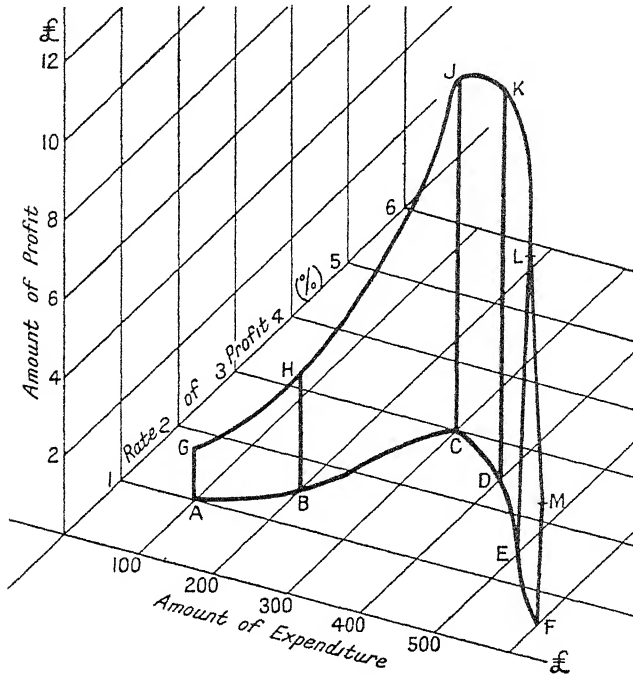


DIAGRAM DD

men call their costs and, in the money inflow, what they call their returns, the sales value of their products. Thus we see in the relationship between outflow and inflow the most familiar relationship of costs and returns.

In the third place we understand that, from the point of view of the business man, the most significant ratio is that between his costs in terms of money and his returns in terms of money. The prices of products and of factors are part of the data within which he operates in his effort to produce such a ratio of returns to costs.

that, when multiplied by the units of money expended, it gives a total in maximum excess over the total expenditure

When we discussed the conception of varying returns of output to input in the chapter dealing with the physical aspect of internal administration we considered the ratio of physical product to physical resources, physical output to physical input. In a chapter dealing with the financial aspect of internal administration the analogous ratio is between financial output and financial input. Any law of returns then, in this case, must be stated with respect to the change in the ratio of the *returns* of money to the outlay or *expenditure* of money as the expenditure or the revenue is increased increment by increment.

If there is, at any moment, in the given price scheme, an optimum organization to which any business can grow, it is an implication of this possibility that beyond a certain point returns in the significant sense must diminish. Thus the general form of a curve must rise for a period and then fall, it is of the type GHJKLM in Diagram DD read in relation to the amount of expenditure given on one of the horizontal axes. The measure of advantage is the net profit.

We have already given reasons for considering that at any given moment there is, lying implicit in the price scheme, an optimum size for every business. If these reasons are sound we may the state the law of returns from the financial administration point of view in the following terms:—

As the expenditure (or revenue) of a business is increased from zero upwards by equal increments, there is at first a stage of increasing total net profit culminating in a maximum total net profit and succeeded by a stage of diminishing net profit

At any given moment a business may be in the stage of increasing, constant or diminishing returns, or, stated inversely, it may be in the stage of diminishing, constant, or increasing cost. Returns are said to be increasing when the revenue increases more rapidly than the expenditure and to be diminishing when it increases less rapidly, in a state of constant returns, revenue and expenditure change at equal rates.

This statement of the law or tendency to varying returns or costs is, curiously, not very generally found in economic textbooks. Economists, of course, usually make clear the condition determining the optimum expenditure of a business but there has been a strange persistence in regarding the laws of returns as relating solely to the production of some particular commodity or service. The reason is chiefly due to the methodology of economists. They have been so largely occupied with discovering the determinants of price



that they have not sufficiently emphasized the likeness between the rates of increase of total expenditure and total revenue and the laws of returns as they generally conceive them<sup>1</sup>

The "laws of returns", as generally given, are either those which we gave in the last chapter or they are statements of the variation in ratio of *physical products* and *financial input* or expenditure. Thus it is commonly asserted that a business is in a stage of increasing returns if the rate of increase of the *physical product* is, at any point, greater than the rate of increase of *physical resources* employed or if the rate of increase of physical product is greater than the rate of increase of *financial expenditure*, and when the ratios are inverted the law of decreasing costs is said to be operating. We have already discussed the "physical" laws and shown the limitations within which we must employ the conception and it is now clear, from the preceding discussion, that the physico-financial ratio is of secondary significance and that there are limitations to the use that can be made of it.

By saying that the physico-financial ratio is of secondary significance we do not mean to suggest that it is of secondary significance to the analytical economist, all that we wish to imply is that, to the business man, it does not take into consideration all the data which he must consider when deciding on production *policy*. The business man must obviously know the connections between expenditure and physical results but he must equally well know the connections between physical results offered for sale and financial returns. We may express the situation by saying that he must know the law of varying costs of physical products, but he must also know the "law" of varying financial returns on "physical" sales. Knowing both of these he will know the law of varying financial returns which is the relationship of primary business significance. The ratio of physical returns to physical input is the primary relationship to the technical man; the ratio of financial returns to financial expenditure is the primary relationship to the administrator of a business.

In the study of the internal administration of a business we see that it is necessary to consider two groups of physico-financial ratios. We must consider the relationship between physical returns or products and financial expenditure, and the relationship between financial returns and "physical sales". The first ratios are of importance to the business man when he considers the prices at which he can afford to sell; the latter are of importance when he considers the cost which he must not exceed. In the first we may say that we are concerned with physical productivity of expenditure

<sup>1</sup> See Carver, T. N., *Distribution of Wealth*.

or financial cost of physical product, in the second we are concerned with the sales yield in terms of money or the selling prices of the products

Though we have said that in the study of the internal administration of a business we must consider two physico-financial ratios (which we may call the "production" ratio and "sales" ratio), we shall, in what follows, have to show that neither of these ratios can really be considered apart from the other. It is probable that beginners in economic reading do not always fully appreciate this fact, largely, it is feared, because of a particular mode of exposition usually adopted by economists in elementary textbooks. The traditional approach to the theory of price is by way of "cost of production" and "demand schedules" and there is a tendency—or persistency—to treat the determination of these two schemes separately. It is only in the case of "joint supply" prices that they are clearly shown to be dependent and this case is regarded as exceptional.<sup>1</sup> In what follows we shall suggest that this "exceptional" case is the normal case and we shall need to employ a distinction that is fundamental, though, for the reason given, not usually emphasized, the distinction between *money expenditures* and *money cost of production*.

The distinction between money expenditure and money cost is analogous to the distinction which the Classical writers failed to emphasize between "real resources employed" and the "real cost of production". By identifying the latter with the former they treated the real cost of production at first as determined by the quantity of labour expended. In neo-Classical works there is the analogous tendency to treat the money cost of production as the money expenditures incurred in its production. Money expenditure is the amount of money (incurred in its production) which is actually laid out in a scheme of production; money cost is the amount of money which must be returned to the producer or seller if he is not to conduct his production or sales at a loss. An example will make the distinction clear.

Let the figures below represent the amounts of expenditure which a farmer incurs in the production of the given quantities of wheat.

| <i>Units of Money<br/>Expenditure.</i> | <i>Units of Wheat<br/>Production</i> |
|--|--------------------------------------|
| 100                                    | 100                                  |
| 110                                    | 108                                  |
| 120                                    | 114                                  |
| 130                                    | 118                                  |
| 140                                    | 126                                  |

Taking these figures as they stand we can give ratios of physical

<sup>1</sup> Marshall, A., *Principles*, p. 390.

product to financial expenditure (returns ratios), and financial expenditure to physical product ("costs" ratios) (average and marginal), and the ratios of increase of physical product and expenditure or expenditure and physical product

They are given below —

|   |   |      |      |      |      |
|---|---|------|------|------|------|
| Average product per unit of expenditure         | 1 | 98   | 95   | 92   | ·85  |
| Average expenditure per unit of product         | 1 | 1 02 | 1 05 | 1 10 | 1 17 |
| Product per increment (10 units) of expenditure | — | 8    | 6    | 4    | 2    |
| Expenditure per increment (5 units), of product | — | 5 5  | 7 5  | 9 0  | 18 0 |
| Rate of increase of expenditure (per cent)      | — | 10   | 9    | 8    | 7 5  |
| Rate of increase of product (per cent)          | — | 8    | 5 5  | 3 8  | 1 5  |
| Rate of increase of expenditure                 | — | 1 25 | 1·64 | 2 1  | 5    |
| Rate of increase of product                     | — | 8    | 61   | 47   | 2    |
| Rate of increase of expenditure                 | — | 8    | 61   | 47   | 2    |

If the variations of these production ratios are examined it will be seen that they all show diminishing physical returns to expenditure or increasing expenditure on products. Thus the farmer may be said to be operating under diminishing returns or increasing cost of expenditure and expenditure and cost are identical.

Now let us increase the data. When a farmer produces wheat he produces straw, wheat and straw are joint products. Let us assume a fixed ratio of wheat to straw and let the extended data be as follows :—

| <i>Expenditure</i> | <i>Wheat<br/>Production.</i> | <i>Straw<br/>Production</i> |
|--------------------|------------------------------|-----------------------------|
| 100                | 100                          | 200                         |
| 110                | 108                          | 216                         |
| 120                | 114                          | 228                         |
| 130                | 118                          | 236                         |
| 140                | 120                          | 240                         |

The ratios which we calculated for wheat production we can also calculate for straw production. They will be different in magnitude, in some cases, but they will reveal the same changes, they will show that straw is produced in this case under diminishing returns or increasing "cost" conditions, again assuming that the expenditure necessary to produce the straw is cost.

It should be noted that in calculating these ratios it is impossible to take, as product, "wheat and straw" for they are dissimilar commodities and cannot be measured in units; ratios of physical returns to expenditure must always refer to single commodities for this reason. But it is clear that the expenditure which produces

the wheat also produces the straw. The ratios we have worked out above give the relationships between production and expenditure and give the necessary expenditures. Do these expenditures give the costs of production?

The answer to this question is obviously in the negative. If, for instance, we say that the 100 units of money is the minimum which the farmer can accept for his wheat it means that the production of 100 units of wheat involves his sacrificing 100 units of money. If it does it is obvious that he is receiving nothing for his straw. To produce 114 units of wheat involves expenditure of 120 units

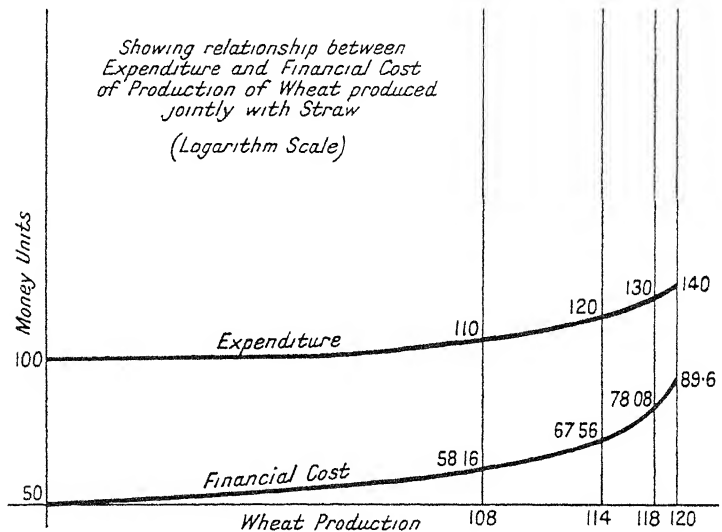


DIAGRAM EE

of money but it *costs* the farmer this expenditure minus what he can obtain for his straw. At every point in the scheme, the cost of wheat is the expenditure minus the selling value of the straw.

To know the cost of production of wheat in this case, then, it is necessary to know the prices of different quantities of straw. The figures below give this extension of data.

|   |     |       |       |       |       |
|---|-----|-------|-------|-------|-------|
| When production of <i>straw</i> is  | 200 | 216   | 228   | 236   | 240   |
| The selling price is (per unit) .   | .25 | .24   | .23   | .22   | .21   |
| The selling value is, therefore   | 50  | 51.84 | 52.44 | 51.92 | 50.40 |
| And the total <i>wheat cost</i> is  | 50  | 58.16 | 67.56 | 78.08 | 89.60 |
| Since selling value of straw plus cost<br>of wheat equals total expenditure | 100 | 110   | 120   | 130   | 140   |

Using these figures showing the relationship between cost and product and comparing them with figures of expenditure and product we have this result —

| <i>Production<br/>of Wheat</i> | <i>Total<br/>Cost</i> | <i>Total<br/>Expenditure</i> |
|--------------------------------|-----------------------|------------------------------|
| 100                            | 50                    | 100                          |
| 108                            | 58 16                 | 110                          |
| 114                            | 67 56                 | 120                          |
| 118                            | 78 08                 | 130                          |
| 120                            | 89 06                 | 140                          |

Diagram EE shows these figures on the logarithmic scale and it is clear therefrom that in both cases we have accelerating ratios of cost and expenditure respectively to the production of wheat.

Now it would seem reasonable to consider that, when wheat and straw are being produced for a given total expenditure the difference between this total expenditure and the cost of producing the wheat should equal the cost of producing the straw. If, however, we assume a certain price scheme for wheat and calculate the cost of production of straw we may have figures that show that total cost and total expenditure are not equal.

In the figures given below we show the calculated costs of production of straw

| <i>Total<br/>Expenditure</i> | <i>Production of</i> |              | <i>Price of</i> | <i>Value of</i> | <i>Total cost</i> |
|------------------------------|----------------------|--------------|-----------------|-----------------|-------------------|
|                              | <i>Wheat</i>         | <i>Straw</i> | <i>Wheat.</i>   | <i>Wheat.</i>   | <i>of Straw.</i>  |
| 100                          | 100                  | 200          | 60              | 60              | 40                |
| 110                          | 108                  | 216          | 59              | 63 72           | 46 28             |
| 120                          | 114                  | 228          | 58              | 66 12           | 53 88             |
| 130                          | 118                  | 236          | 57              | 67·26           | 62 74             |
| 140                          | 120                  | 240          | 56              | 67·20           | 72 80             |

We may now take the total cost of the straw and the total cost of the wheat at the various scales of expenditure and we find the following results —

|  |         |        |          |         |         |
|--|---------|--------|----------|---------|---------|
| Production of wheat                      | 100     | 108    | 114      | 118     | 120     |
| Production of straw                      | 200     | 216    | 228      | 236     | 240     |
| Selling value of wheat                   | 60      | 63·72  | 66 12    | 67 26   | 67·20   |
| Selling value of straw                   | 50      | 51·84  | 52 44    | 51 92   | 50·40   |
| Total value of produce                   | 110     | 115·56 | 118 56   | 119 18  | 117 60  |
| Total expenditure                        | 100     | 110    | 120      | 130     | 140     |
| Difference (net profit)                  | 10 00   | 5·56   | — 1 44·5 | — 10 82 | — 22·40 |
| Cost of wheat                            | 50 00   | 58·16  | 67·56    | 78 08   | 89·60   |
| Cost of straw                            | 40 00   | 46·28  | 53 88    | 62·74   | 72 80   |
| Total costs                              | 90 00   | 104·44 | 121 44   | 140 82  | 162·40  |
| Difference between costs and expenditure | — 10·00 | — 5·56 | + 1 44   | + 10 82 | + 22·40 |

This would indeed seem to be a strange result—to those who confuse costs of production with expenditure—that when a profit is made expenditure should exceed costs by the amount of profit.

The explanation, however, is very simple. The *costs of production* are calculated with the use of selling value data and these data include the profits. The *expenditure* is given independently of selling prices but *costs* of production of the separate products in joint production cannot be discovered unless selling prices are known. It will be recalled that in our study of physical relationships we pointed out that all production is joint production<sup>1</sup> in the sense that no single product can be produced without some associated product. It is this fact upon which we have worked in our present discussion and we have shown that the cost of putting wheat into the market cannot possibly be regarded independently of the price of straw which is inevitably produced with the wheat. Since there is no such thing as a single product it follows that *in every case* the cost of producing a commodity must always be calculated by reference to the selling value of other things produced in association with it.

Even when we consider a case in which one kind of product only possesses any value, all others being waste, the rule still holds. If, for example, straw has no value, so that when the production of wheat is expanded we need not consider the value of by-products, it still remains true that we have to consider the value of the wheat produced *other than the increment*. If the farmer decides to increase his output by one unit he must reckon, as the *cost* of this unit, the additional expenditure *plus* the loss he suffers on his previous production if the price falls.

This fact, that, in reckoning the *financial cost* of a commodity, the selling prices must all be considered, implies a most important conclusion with respect to profit. We have shown that profit is to be regarded as a "surplus" of revenue over expenditure. Since, however, profit is included in sales returns, it follows that it must be regarded as an element in the cost of production and the conception of "surplus" must be rejected.

The relationship between financial cost of production and expenditure on production may be expressed in the form of an equation and the equation may have reference to incremental or total cost and expenditure.

- 1 Incremental cost of pro- = Incremental  $\pm$  Changes of money value  
duction of a commodity Expenditure of other products
- 2 Total cost of production of a = Total — Total receipts from  
commodity Expenditure other products

<sup>1</sup> Note that "joint supplies" are usually regarded as "things which cannot easily be produced separately" (Marshall, A., *Principles*, 388). See also Henderson, H. D., *Supply and Demand*, ch. v. We use the term to cover associated product whether their proportions can be varied or not.

It follows, then, that cost and expenditure are equal, only when the second term on the right hand side of the above equations is equal to zero, and this occurs when (a) one product of value only is considered and (b) its price is not affected by changes in the quantity offered for sale. This is the case which economists usually consider when they expound the "laws of costs and returns" but it will be clear that such a case is a special case of joint production is the normal case.

We are now able to see that the physico-financial "laws of returns and costs" can only be stated with respect to the quantity of *one* physical product and its financial cost as conceived above. If the production of a commodity is subject to the law of increasing financial cost, then the costs of successive increments (calculated by deducting, from the necessary increments of expenditure, the increments of value of other products), increase as the physical output increases. Incremental expenditure<sup>1</sup> necessitated by an increment of output is not necessarily a measure of the rate of increase of financial costs—indeed, it is only so in the cases where other revenues are unaffected, thus making expenditure and costs identical.

Further, our analysis makes clear the necessary condition of an optimum adjustment of business expenditure and income in all businesses with respect to the costs of production of the various products. The first condition we have laid down is that in equilibrium the marginal expenditure of a firm is equal to its marginal revenue, and the second condition is that the marginal cost of production of a commodity is the marginal expenditure necessary for its production *plus or minus* the revenue change from other products. The combined result of these generalizations we may present as follows: we take the case of joint production of the goods (1) and (2)

Let  $dE$  equal marginal expenditure of the firm on both products,  
and  $dR$  " " revenue " " from " "

In equilibrium  $dE$  equals  $dR$ .

Let  $dR$  equal the sum of the separate increments of revenue from (1) and (2), i.e.  $dR$  equals  $dR_1 + dR_2$

Since  $dR$  equals  $dE$ ,

$dE$  " "  $dR_1 + dR_2$  and  $dR_1$  equals  $dE - dR_2$ ,  
and  $dR_2$  equals  $dE - dR_1$

But  $dE - dR_2$  equals marginal cost of commodity (1), i.e.  $dC_1$   
and  $dE - dR_1$  " " " " " " (2), i.e.  $dC_2$

Therefore  $dR_1$  equals  $dC_1$  and  $dR_2$  equals  $dC_2$

<sup>1</sup> An increment of expenditure is the only interpretation that can be placed upon the term "dose" of capital and labour, etc. (Marshall, A., *Principles*, pp. 170–2), or the unit of "flow of resources" (Pigou, A. C., *Econ. of Welfare*, p. 191). Marshall's historical law of returns thus involves his use of a historical standard of value, a day of unskilled labour.

The condition of equilibrium of a business producing one or more commodities is, then, that the marginal cost of production equals the marginal revenue from each commodity

Another important point which our discussion has revealed is that the change in selling (or consuming) conditions brings about a change of the patterns of production because it alters the scheme of costs of production. Since the costs of production can only be calculated on the assumption that selling prices are known, it follows that any changes in the latter involve changes in the former as the organization tends towards a new equilibrium. In the new equilibrium, marginal costs and marginal revenues will once again be equal, and so we have once more a conception of elasticity of substitution as the ratio of the change in proportions of physical products produced for sale, to the change in relative marginal prices (or marginal costs of production). It might, of course, be considered that where joint products are always produced in the same proportions, the elasticity of substitution should always in their case be zero. This, however, is not always the case since it may be that a firm will "produce" and destroy some or one of its own products. The marginal cost of production is the cost of producing *and selling* the marginal unit sold.

We are now in a position to see fully the conditions determining the variation of costs with the variation in amount of output from a firm and we are also in a position to see the inadequacy of the ordinary statement of these conditions. We said above that a business administrator has to bear in mind two ratios of the physico-financial type, the ratio between financial cost and physical product and the ratio between financial product and "physical sales". Our analysis has already suggested that the usual statement of varying efficiency of business organization lays undue emphasis on the former.

In discussing the "laws of returns" under conditions of increasing output it will be observed that economists generally exhibit the "economies of buying" which may be effected: it is true that they discuss the "cost of selling" but, strictly speaking, this also is an expense of buying—buying the services of salesmanship and advertisement.

Reference is usually made to the limitations on the growth of a business imposed by the "saturation of the market" but this reference is not generally very extensive. The conception employed is that cost of production means "cost of factors". It is a survival of the "physical laws of returns" which were first discussed by economists at the end of the eighteenth century.

It must not be thought that we are suggesting that the usual analysis is incorrect; it is perfectly sound, so far as it goes, but



it is not complete. There are variations in the efficiency of buying power which are caused by the production of varying quantities, but there are, also, variations in sales efficiency which must be considered. It is the latter variations which are neglected and they are neglected because the universality of joint production is not usually exhibited, with the corollary that selling values must be considered in the computation of costs.

Our own explanation has, perhaps, under-emphasized the significance of the circumstances which expenditure analysis reveals, so we must now draw attention to these. In the process, however, we shall show how the full appreciation of these requires us to go further and consider "sales analysis".

When a firm expands its output, its changes in production involve (a) the use of different quantities (and sometimes different kinds) of resources, (b) the payment of different prices for the new resources employed or (c) both the use of different resources and the payment of different prices. Sometimes the quantity of resource is not changed but the "amount of service" which it renders is changed and the price that must be paid for the new service is different from that paid for the old.

The condition of "increasing returns" or "diminishing cost" is usually explained as making fuller use of certain resources at no extra expense, or the use of "waste capacity". When all waste capacity has been utilized, the unit is operating at minimum expense per unit of service<sup>1</sup> assuming the service to be homogeneous. The technical processes of division of labour, etc., are the means of utilizing these wastes.

When a railway is built and twenty trains a day are run, a further train can be put upon it at no extra track expense. This does not mean that the train does not use the services of the track, it merely means that the service can be obtained by the company for nothing. When an excursion train is run the services of the porters and booking clerks are not considered as part of the expense, but this does not mean that the train does not use these services; on the other hand it frequently employs many such services—more than an average non-excursion train—but it does mean that these services can be obtained for no further expense. In some cases extra labour at overtime rates may be brought in because what the train "saves" in some expenses is adequate to cover these extra rates and still leave room for a low fare as compared with the ordinary fare. When a farmer rents a field he may use it, we will say, to grow 20 bushels of wheat to the acre or anything up to 40 bushels. If he grows 20 he is not using the field to full

<sup>1</sup> Robinson, E. A. G., *The Structure of Competitive Industry*, p. 15.

physical capacity. Thus, supposing he only wants to grow 20 he *wastes* the other 20 bushel capacity. If he wishes to increase his crop, however, the extra service of the land involves him in no extra expense

The secret of increasing efficiency of expenditure with the increase of output (assuming, of course, a single product firm) is, then, that at each stage of production there is a new *price scheme of factors*, or uses of factors. This is the basic fact. It is true that when a large quantity of goods is being turned out it is possible to indulge in specialization, but so it is when a small quantity is being turned out. A motor car manufacturer can organize a factory on the "moving belt" system even if his output is only one car a year, but of course he would be foolish to do so, because it would not pay. Organization is determined certainly by technical possibilities, but the selection of the technical mode is determined by price considerations also. When a physical organization is such that it allows physical possibilities to lie idle, and these idle possibilities are there because there was a physical necessity for them to be acquired along with the required possibilities, there is a condition in which further services can be utilized at no further expense. The economies of large scale buying are due to the possibilities of similar economies on the part of the sellers.

This kind of circumstance is, however, only a species within a larger genus. "Waste products" are an instance of the same or similar character. If the waste products can be turned to valuable purpose, the "cost" of the main products is reduced. If they are re-employed (as, for instance, certain gases are re-employed in blast furnaces), they reduce the cost of the product.

The utilization of waste products in the process of production is not, however, the only mode of disposal. They may be sold and this brings us to the consideration of sales returns to which we referred above. The changing cost of production of changing amounts of product are due not only to the economies of buying but to the sales prices which can be obtained for the whole quantity of product.

The counterpart of expense analysis is sales analysis and just as the business man has to be able to estimate the expenditure on certain factors so he has to be able to estimate the return on each product or unit of product sold. When the business sells goods it buys money and a ratio at once occurs as a possibility between the outflow of services and inflow of money. It is the other physico-financial ratio to which we have referred and the business man regards it, as he regards the first, as a measure of his increasing or diminishing power of cultivating the market.

To a business man, customers are so many "factors of revenue

production" He applies boots here and shoes there, many boots here and few boots there—he applies his "output" to provide him with his inflow and the conditions determining his optimum sales, quantities and proportions of different commodities in different markets, are the same as those which determine his optimum production.

In the first place, just as, ultimately, the business man finds himself producing any single commodity at an increasing expense, so, in the sale of a commodity he finds himself selling at a lower average price. The two facts are, of course, ultimately related through the limitation of means within which every economic unit operates. In a world in which everybody needs a variety of products and all production needs a variety of factors such as, of necessity, the case

In the second place, the condition of the optimum sales is the same condition as that of the optimum production. The marginal revenue in this case is equal to the marginal cost of production of the firm—revenue from and marginal cost of all products sold. Also, the marginal revenues from all sales of different quantities of service in different markets are equal to their marginal costs of production. When the optimum distribution of products is effected the extra revenue which could be obtained from selling another unit of any product or another unit in any particular market is equal (assuming small adjustments possible) to the cost of supplying it.

All of this lies implicit in what we have already said of the production ratios and, after all, it is what we would expect. The process of production includes the process of selling and the conditions determining the optimum production must be identical with those which determine optimum sales.

We may now summarize the analysis which we have presented and this we must do by showing that there are three "laws of returns" in which the administrator is interested, in addition to the physical returns ratios of prime significance to his technicians.

In the first place there is the *Law of Variable Ratios between Total Revenue and Total Expenditure* when the expenditure includes interest on the capital whose turnover involves expenditure. This is the "law" of supreme importance to the business man. It is a conception in which the product is money, and the factors are money, and the optimum point is reached when the absolute difference between expenditure and revenue is at a maximum. At this point the marginal revenue and marginal expenditure are equal. Before this point is reached the ratio between the successive increments of revenue and expenditures may pass through a stage during which it is less than unity, but it must, in such a case, pass through another

in which it is greater than unity. The average revenue per unit of expenditure may begin to fall at an earlier stage than the optimum, a reduction or increase of expenditure involving a loss of revenue which is greater or a gain of revenue which is less than the reduction or increase respectively. No business is in equilibrium until this point is reached. If we define the law of diminishing returns by reference to the optimum in this way, then we may say that the condition of equilibrium implies that all businesses are at a point of diminishing returns; it does not pay them to move in either direction. This "law of returns" is one in which both terms are money, one which we have called a "financial" law.

The second and third "laws" are physico-financial: the "law of varying cost" and the "law of varying sales returns" in each case the terms of the ratio considered are real resources or goods and money.

The *Law of Varying Cost* is a statement regarding the ratio between a single product and the financial cost of a variation in the amount of it. We have shown that this depends upon the varying price schemes of both factors and products. The cost of an increment of a physical product depends upon the necessary increment of expenditure, including interest, and the changes in value possessed brought about by the influence of the increment of product on the values of the products in general. It is a statement of the variation of cost of a joint product and is applicable to all products, the single product firm being exceptional even if not entirely an abstraction, for immediately quantities are changed we have a possibility of changing selling prices affecting other products besides the increment.

The *Law of Varying Sales Returns* is really a statement of the relationship between the amount of money received from a particular customer and the amount of product sold to him. In making his sales among the different customers the business man considers the expenses of transferring the sale (distribution, advertisement, etc.), and, in addition, the money return which he sacrifices. He distributes his sales so that the marginal revenue from each customer equals the marginal cost of supplying the service which causes the increment of revenue.

The main fact to note is that we cannot speak of a ratio including the total expenditure as one of its terms except in the first case where total revenue is the other term. In the second place, we must relate the product increment to the *cost* which is a net expenditure. This arises from the basic fact that costs depend upon selling prices as well as factor prices.

The practical significance of this analysis is as great as its

theoretical significance Accountants generally, during the last generation, have concerned themselves with what they have called "costing". This is a process of discovering the part of the expenditure which they may attribute to any particular product or quantity of product, with a view to their discovery of the minimum price at which the businesses, whose accounts they analyse, may sell This "minimum", even when a single product is produced, is not necessarily the price below which they cannot, in some cases, go: it is simply a minimum average: it may be profitable to make differential charges, higher and lower than this. When differential charges are made consideration is given to the selling price possibilities of all customers and though the average expense of production may not be reached, the lowest price paid will cover the "prime costs of production". When accountants deal with by-products or joint products they meet with their greatest costing difficulties: this is not surprising for they are attempting to discover the prices below which they *may not* sell, and, in order to do so, they need to know the whole scale of prices at which they *can* sell.

## CHAPTER IV

### THE PSYCHICAL ASPECT OF INTERNAL ADMINISTRATION

In the second chapter of this section we dealt with the physical aspect of the business of living and examined the physical limitations and possibilities within which the life of the individual or group must accommodate itself. In the third chapter we dealt with the administration of resources from a financial point of view and, accepting the price scheme, we pursued our discussion on the assumption that business units aimed at the possession of the maximum amount of money's worth. We must now direct our attention to the psychical forces or conditions within which all administration of resources takes place.

The pattern of living of a person, as we have repeatedly emphasized, is a scheme of spatial and temporal juxtapositions of material resources bound together by the significance of these juxtapositions to the person concerned. It is essential for the present exposition that readers should have a visual impression of this scheme, so an attempt has been made to present it in Diagram FF.<sup>1</sup> The conception has been borrowed from the physicists in their recent expositions of time-space theories.

This diagram purports to be a representation of the location of materials in time and space. To show these locations it is necessary to have datum lines—corresponding to the Equator and the Greenwich line of longitude in mapping the earth. One datum line is the standard of time reference and the other is of space. The line running across the middle of the diagram is called the “now” line and this divides time into future and past: the line running down the middle of the diagram is called the “here” line and this shows space as elsewhere, on “both sides of here”. An individual administering his resources must, of course, be located at the point of intersection of these two lines, at the point “here and now” in the centre of the diagram. From that point he moves on into the future and space in a continuous line, which may be regarded as a series of time-space points represented by the dotted line, and

<sup>1</sup> The author saw Sir Arthur Eddington use a similar diagram as a “map of events” in a lecture on the Theory of Relativity.

there are many such lines along which he might travel. Not only does he travel through space-time but so do the material things about him, we can represent the "life lines" of these things also. If we think of these material things as trees, animals, houses, etc., it is clear that the lines will run in various directions and for varying

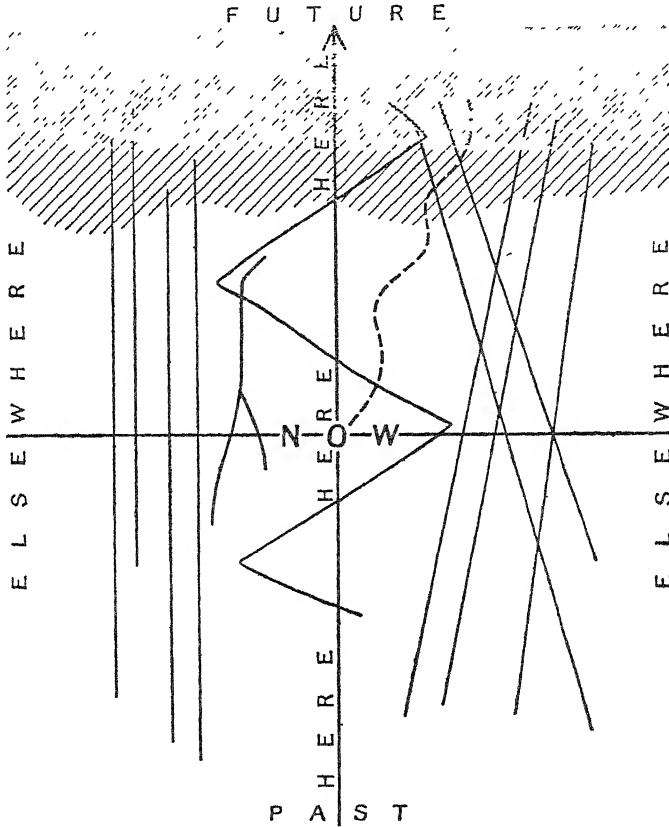


DIAGRAM FF

lengths, some will join and some will break apart, but all will run upwards since they must travel through time into the future. In the early chapters of this book we spoke of the administration of resources as the weaving of patterns, this diagram shows us the threads which man weaves.

Now the central conception of a pattern is that it is a scheme of

relationships and the essential condition of pattern making is that a scheme of relationships shall be seen by the pattern maker. If I splash colours on a canvas in a higgledy-piggledy manner it cannot be said that I am producing a pattern, an artist is one who puts his colours on the canvas so that a foreseen end is attained and the foreseen end is a scheme. It follows from this that it is an essential condition of administration that the administrator shall have foresight and shall be able to perceive things in space. He may also see things in the past, and the pattern he weaves in the future may be "fitted on" to the pattern which has already been produced to make a best whole pattern.

Referring back to our diagram we may imagine a circle round the point "here and now" representing the "field of awareness" about the administrator. As a firefly goes through the darkness of night at the centre of its own light, so our administrator may be regarded as passing through the darkness of space-time at the centre of light—the light of his awareness. Within this field of awareness he moves himself and allocates the resources over which he has control; in other words he takes the most attractive route and makes the most attractive pattern.

This is the basic psychological conception with which the economist works. Human activity is "impulsive" activity within a wider or narrower, darker or lighter, field of awareness. The nature of these impulses is no part of the economist's field of investigation: that belongs to the psychologist. Nor is it any concern of the economist whether or not men pursue pleasure and avoid pain in all their activities or whether they pursue their own self-interest or the interest of others. Such matters belong again to the psychologist whose subject matter is the behaviour of the mind. The economist has no concern further with the passing of final judgments on the rightness or wrongness of human action nor with the ultimate purposiveness or purposelessness of it.<sup>1</sup>

The field of study of the economist is the making of patterns of material resources and it is extremely important, then, that he shall understand that man's activity may be conducted within varying "degrees" of awareness. There can be no pattern made unless there is a field of awareness. The making of a pattern implies a *view* of the relationships of resources in time and space. It implies the pursuit of an end and there can be no assurance of an end being attained unless the person pursuing it is aware of the means of attaining it. "Blind" activity cannot produce a pattern. It will be clear to the reader that the point we are making is that man's activity may be more or less *rational* or more or less *impulsive* bearing in mind

<sup>1</sup> Robbins, L., *Nature and Significance of Econ. Science*, ch. 11.



the danger of using psychological terms on the part of those who are not psychologists, we may say that human conduct is more or less *rational* or more or less *instinctive*. Only to the extent that their behaviour is rational can they be said to make patterns.

We have spoken of the field of vision or field of awareness as a sphere of light in time-space. Strictly speaking, of course, it is not a sphere since that is three dimensional and life is lived in four dimensions; the field of vision is something more akin to a "tunnel of light" the volume swept out by a sphere of space travelling through time. The shape of the field is a matter of no importance to economists but it is a matter of considerable importance that there are limits to the field and we must consider these. Our problem is really a consideration of the limits to sight, foresight, and insight.

That there are limits to the range of the senses—to perception range—in space is quite obvious. Distance renders things less visible to the eye and makes the possibility of hearing, smelling, tasting, and touching more remote. There are limits to knowledge and understanding of the reactions of certain events on one another and there are, consequently, limits to the powers of imagination both in considering what will happen in the future or what can happen in the future. We cannot perceive all things, we cannot understand all things, we cannot foresee all things. There is in truth an outer field of darkness, a field of which we are ignorant or unaware.

There are some things, however, which we can see clearly, understand clearly, and foresee clearly. These vary in time location and space location and between these things and the field of darkness outside there is a field of indistinct vision. Within the field of indistinctness certain things may be but they also may not be; we are not sure. The field of indistinctness is the field of uncertainty.

The field of awareness within which a person administers his resources is a field in time and space, within his imagination largely,<sup>1</sup> but perceived by his senses along the near boundary. On this field of time and space he sees various patterns of resources but over all these patterns there hangs the pall of uncertainty. In the far distance of time the cloud is so heavy that nothing is seen, in the nearer distances the shadows are distributed unevenly. Uncertainty is distributed with an intensity varying from zero to a hundred per cent, so to speak.<sup>2</sup>

That uncertainty reduces the attractiveness of a pattern or

<sup>1</sup> Cf. the "behavioural environment" of Koffka, K., *Gestalt Psychology*, ch. 11.

<sup>2</sup> In the diagram this is shown by shading.

scheme is well recognized in economic discussion and the phenomenon is described as a process of "discounting for uncertainty". An illustration from the market is easy to supply; a security of the British Government promising £5 per annum is normally worth more than an industrial security promising the same amount because the certainty of one is greater than the certainty of the other. Economists generally claim, however, that there is a second discounting effected by men, namely, "discounting for futurity." This requires further consideration

The form in which this theory is usually put is as follows: a person, in estimating the present value (or attractiveness) of a future benefit makes a deduction from its future value that increases with the period through which the benefit is deferred, simply because it becomes more distant. The explanation given is that all men are impatient to enjoy in the present, though some are more impatient than others

To examine this theory it is necessary to consider a person as estimating the relative attractivenesses *now* of two benefits in the *future*, at two different times in the future, the conditions being such that their costs are equal and if one is accepted the other must be sacrificed. To eliminate the influence of uncertainty we can reckon them as both being absolutely certain. It is impossible to find such a case in real life for life is uncertain, the case must, then, be purely imaginary and we must depend on logic to assure us.

Suppose I am offered with absolute certainty, a meal to-morrow or a meal a year hence, and suppose I *know* that I shall derive the same amount of satisfaction from one as from the other, but that I can only eat one of them. If I eat it to-morrow, I go hungry a year hence; if I eat it a year hence I shall go hungry to-morrow and the pains of hunger are equal in both cases. Which shall I choose? There is, obviously, no reason at all why I should choose one or the other. The only way of determining the deadlock is to toss a coin.

We have said that it is impossible to give cases in real life because there is an element of uncertainty in life always. There are, in fact, cases which approach in conditions those required in theoretical analysis. A woman may be asked on a Sunday if she will accept a theatre ticket for Wednesday or Thursday. She knows she will be free on both of these evenings and she reckons the joy of going on Wednesday as equal to the joy of going on Thursday. She is in a dilemma, she leaves it to her host to decide without even thinking to herself that she must go on Wednesday "to make sure", since the uncertainties are not reckoned.

We can further understand the position if we consider the other dimension of our pattern of living, namely, space. A moment's consideration of this dimension will show that men direct their attention to things that are near in space rather more than to things that are remote in space. It would seem, then, that there should be a possibility of discovering a process of "discounting for space" or discounting for distance in space.

A man looks out of his window and thinks to himself that he would like a tree planted either ten yards from his window in one spot or twenty yards from his window in another spot; he can have either of them as a present. He will not decide on distance; he will toss his coin. Suppose now he has to plant the tree himself. This introduces another set of circumstances. He will consider which tree will cost him more to plant and choose the one which is cheaper. Distance enters into his calculations now because in travelling distance he is travelling through time and using resources which might be used in other directions.

This is an idea which we can transfer to the consideration of a person weighing the relative pulls of two equal satisfactions located at different points of time. If they are to cost him nothing and he knows that they are equal he will have to choose by the toss of the coin, but if they are to involve different costs he will choose the one which is less costly to attain.

Now the upshot of this discussion is that from the purely rational point of view—the point of view from which man is seen "weighing satisfactions" against one another—there is only one discounting process that can be considered, namely, the discounting for uncertainty; there is no *reason* which we can adduce for a person preferring a present rather than a future of two equal satisfactions because they are located at different points of time any more than there is reason for his always preferring things that are near in space. If there is any discounting for futurity it must be on irrational grounds. Economists would seem to recognize this by attributing the tendency we are discussing to impatience to enjoy in the present. Impatience—and patience for that matter—is irrational.

The pattern of a person's psychological dispositions at any moment may be taken as given; we have nothing to say concerning responsibility for that pattern; it simply is what it is. According to the environment in which he is placed he will react in a certain way. If he is hungry he will search for food; if he sees food he will proceed to eat it. If his friend is in danger he will attempt to ward off the danger and take up the resources which will enable him to do so. If he is hungry and his friend is in danger, he may hesitate between two courses, but one impulse will win and the other will be

overcome. He will feel the pull in both directions but the stronger pull wins.

No man can be in two places at once, nor can he give two decisions at once. The process of living and the process of administration are processes that occupy time and during this time the pattern of dispositions changes, being determined by psychological and physiological experience and conditions. To the animal whose actions are purely instinctive there is no "choice" in the line of action to be taken. To the man who is aware of possible other schemes of activities there are pulls and counterpulls in his consciousness and it is this awareness that constitutes choice.

All impulses or dispositions which affect our patterns of living are present dispositions. That is, all administrative decisions are made, one after another, in the present moment, at the moving point "now" in our diagram. Suppose a person, looking into the future, sees a danger threatening his friend a week hence. Suppose, however, that he feels hungry. In which direction will he move? Will the danger to his friend seem less because it is a week away than his hunger which is present? We cannot say. Allowing for the certainty or uncertainty of the one occurring and the certainty or uncertainty of the means of satisfying hunger too, the action taken will depend upon their relative strengths. His fear for his friend may be so great that it overcomes his concern for his hunger or his hunger may be such that he turns his attention from his friend. If there is any tendency to pull his resources towards the attainment of future ends against present or near future ends or *vice versa* it is because the impulse is stronger in that direction.

The allocation of present activities to near and more remote future ends is the result of a rather complex situation. In the first place there may be a tendency to disregard the future on purely irrational grounds. This may lead to a concentration of resources on the attainment of immediate satisfaction or on the avoidance of immediate dissatisfaction. In the second place there may be a tendency to concentrate attention on the near future because the more remote future is more uncertain. This is irrational but it is probably of very great significance. The future is uncertain and, in general, the more distant the future the more uncertain is any event. In the third place, in some cases, the attainment of a more remote future end involves the incurring of accumulating costs, the allocation of a "stream of resources" involving the sacrifice of satisfactions to an extent which varies with the length of time between the present and that future point. An increase of means may affect the allocation to future ends because this scheme of cost is thereby affected. It may now appear profitable to summarize

what we have hitherto attempted to expound and proceed to describe one or two derived conceptions that are of importance to the economist

The main proposition which we have tried to substantiate is that the administration of resources is essentially a rational process. The actual distribution of resources may be effected rationally and irrationally and, indeed, we have shown that all activity has an element of irrationality in it ; to the extent, however, that the resources are *disposed of* or *administered* they are disposed of within a field of awareness of various possibilities. If we consider the life of an animal to be entirely irrational (purely instinctive, as it was once thought), we mean that its activities are all impulsive, undertaken with no conceived end in view its behaviour is merely movement and it cannot be said to make any pattern of resources. If, for instance, we suppose that bees behave in a purely instinctive manner, then the high degree of organization which we see in a hive is not an organization or pattern of living at all, *to the bees*—the pattern is only visible to those who see the whole. It is the result of a particular concatenation of impulses in the bees and they do not see ahead what they are “ producing ” <sup>1</sup>

Some of the behaviour of men is of this order. that is, some of the activities in which men indulge are undertaken with no consideration of ultimate effects. In fact, as we have pointed out, there is an element of the irrational in all our behaviour and, to this extent, to the extent to which we do not behave in a field of awareness, we are not administering our resources. The importance of this conception of the nature of administration as a rational process is that there is no guarantee of a properly equilibrated pattern of resources being attained—unless we make the assumption that “ blind instincts ” are infallible guides. Further, our analysis makes clear that the possibility of man’s ever attaining a perfectly equilibrated scheme of living depends in part upon his understanding the nature of the human mind so that its impulsive tendencies can be foreseen. This is the meaning of the claim put forward by some social reformers, that we must organize our living so that a properly co-ordinated play of instincts is allowed for in all members of society. The claim has a scientific basis <sup>2</sup>. The attainment and maintenance of perfect equilibrium involves a complete rationalization of our living, rationalization here meaning the making of ourselves completely aware of what we are doing.

One of the most outstanding examples which we may quote as

<sup>1</sup> Maeterlinck, *The Life of the Bee*.

<sup>2</sup> Russell, B., *The Prospects of Industrial Civilization* Kyrk, Hazel, *Theory of Consumption* Hadfield, J. A., *Psychology and Morals*

illustrating our point that "instinctive" action leads to disequilibrium is, perhaps, seen in the field of international relations. At the present stage of social development it seems quite clear that man's instincts to protect their national security or national standards of living are very strong. Sometimes circumstances arise when, there is no doubt, men act with no thought of consequences, no awareness of what will happen afterwards, and they proceed to indulge in "blind activities". A large amount of warfare—military and "economic"—is merely instinctive action, merely irrational. It does not attain an end that is foreseen, it simply creates a situation that has to be dealt with later.

A most important conception derived from the foregoing discussion of rational activity as constituting administration is the conception of *real costs* employed by economists. Real costs are only possible in rational behaviour.

The basic element in real costs is that they are sacrifices. Sacrifices are experiences and, of their nature, must be consciously felt. They can only arise when there is a conflict with regard to the use that may be made of specific resources. The Classical idea was that real costs were measured by the quantity of resources employed—what we have called "input"—in the production of a given end. Resistance to the attainment of an end is not felt, however, merely through the quantity of energy or things employed but by the counterattraction which tends to draw the resources required towards some other end. It is usually expressed by saying that the real cost of using a resource in a particular way is the alternative use that is sacrificed.<sup>1</sup>

This "displaced alternative" must, however, if it is to serve as a resistance to some particular use, be felt by the administrator and this means that he must be conscious of the "pull and counterpull". To be conscious of pull and counterpull he must be aware of the possible alternative uses, and a decision given, in a field of awareness of possibilities, is a rational decision. Those animals, if any, which act on purely instinctive principles, cannot feel the alternative use sacrificed and so they have no real costs in the economic sense. Men, acting under the influence of an instinct, blind to all else but the end pursued, feel no costs; they make no sacrifice of alternative uses, they feel no resistance in the way of alternative uses, they "spill themselves and their resources" with no sense of limitation. Physical resistance makes them reflect or use the method of trial and error to discover more effective means of arriving at their ends, but their activities are costless and the resources they employ are costless.

<sup>1</sup> Wieser's Law

- In times of war, or intense industrial strife, riots, speculative booms, certain instincts take charge, heightening the brilliance of certain ends, blotting out the significance of other ends, causing those who are involved to utilize resources with little or no sense of cost. The sacrifices made in war, the "excesses" committed in riots, the "plunging" in booms—all are cases of failure to reckon costs, failure to see widely over space and time, failure to see the implications of their activities, there seems to be no alternative uses for any resources held, so into the maelstrom everything is thrown. In time, however, neglect of other ends causes situations to arise in which other impulses begin to stir—it may be hunger or family danger—and conflicting uses of means arise, psychical resistances develop and this is the beginning of "rational conduct" Real costs begin to be incurred, and action within a field of awareness develops

Another important idea that emerges from this discussion is that there can be no conception of an *optimum pattern* of living except to a person who behaves rationally. Only to these is there a conflict of possibilities and, therefore, a choice Each individual regards as the best pattern that which attracts him most strongly, so if action is purely instinctive there is no best because there is no choice, there are no alternatives

To the person who is aware of the actual and possible locations of resources in time and space it is possible for him to say, "This scheme is best" By saying it is best he means that the attractiveness of every allocation of which he is aware is such that this overcomes the attractiveness of any other allocation. There is no best or worst or scale of preferences<sup>1</sup> without this awareness of things amongst which preference must be expressed

The theory of "marginal satisfaction equality" is but a derivative of the conception of an optimum when the pattern is thought of quantitatively. If a pattern is best it follows that the resistance to a change of the pattern is at least equal to the attractiveness of the change If we think of the changes as large and small it follows that the smaller the quantities of substitution made, the smaller the "quantities" of resistance and attractiveness concerned, and if the changes can be regarded as infinitesimally small we may say that the infinitesimal attractions and resistances are equal and this will be an all-round position amongst those resources whose quantities can be so modified The "technique of thinking" which we employed in earlier chapters, then, can be employed here Substitute patterns or changes of pattern involve resistances

<sup>1</sup> Cf Wicksteed, P H, *Common Sense of Political Economy*, vol 1, chap i, edit by L Robbins

which are greater than or equal to the attractiveness of the existing pattern.

It does not matter how we measure the pattern changes; the optimum pattern, assuming infinitesimal adjustments possible, is such that "marginal substitute attractions" are equal. There are several measures which men make and each must conform to this condition of equimarginal substitute attraction and counter-attraction.

Suppose, for instance, we measure the attractiveness of the pattern measured in time units and let us consider the habitual allocation of a day or week. This period is allocated to work, recreation, and sleep. On reflection our administrator will say, if he has the optimum pattern, that the attractiveness of a minute more devoted to sleep is not so great as its attractiveness in its present devotion to work or recreation or, at most, it is only equal and there is no reason to change it. And so, with other marginal adjustment. Sleep, work, and recreation time have equal marginal attractions.

If now we consider the amount of money spent in a week the same reasoning will apply. If the allocation is the optimum allocation it follows that on reflection the administrator considers that the allocation to every line of expenditure is such that its marginal attractiveness is equal to that in every other line of expenditure.

In the allocation of means to "present" ends and "future" ends, the same principle is seen at work. The attractiveness of the marginal unit saved is equal to the attractiveness of the marginal unit spent. The marginal allocation to something which is to happen fifty years hence is equal to or greater than the allocation of that marginal unit elsewhere. Saving, spending, hoarding, investing, the four ordinarily considered modes of allocation, are adjusted in such a way that marginal attractivenesses are equal. The "cost" of spending more and saving less is the attractiveness of the money saved rather than spent. The cost of spending less and saving more is the attractiveness of the spending which the saving curtails.

The allocations of quantities of similar goods in different places are determined by the same principle, the cost of transferring one unit to another place being equal to or greater than the attractiveness of the new location. When money is invested in concerns of unequal risks the allocations made will be such that the marginal pound (or other unit) invested in one direction is equal in attractiveness to the marginal pound invested in any other direction.

The principle that an allocation of resources is optimal when the



ratio of the attractiveness of some other allocation to the given allocation is unity or less than unity is one which applies to all pattern making. Pattern making as we have seen implies an awareness of various possibilities, and is rational, so that this principle can only be regarded as applicable to rational behaviour or behaviour that involves reflection. Purely instinctive behaviour cannot be said to involve a weighing of "costs and returns" <sup>1</sup>

This is a very significant point in the consideration of our economic system. To the extent that human action is not rational it is clear that it cannot be regarded as administration at all and, further, it cannot be said that men exercise choice, incur real costs or establish an optimum with equal marginal substitute satisfactions. Since these are the essential ideas employed in ordinary economic analysis it follows that ordinary economic theory does not explain the actual distribution of resources completely <sup>2</sup>

Between instinctive action and rational administration there is another field which requires investigation, namely, the field of habitual behaviour. A person is said to develop a habit when he responds similarly, without reflection, to a stimulus which he has experienced before. The field of habit, it is clear to see, is an enormous one. Can it be said that habitual behaviour is administration?

The first performances of what afterwards become habits may be acts that are definitely rational, in that they are undertaken within a field of awareness. The formation of good habits is sometimes deliberately undertaken as part of the process of producing an optimum mode of living. But when the habit is formed there is no doubt that it loses some of its administrative or rational nature and approaches "instinctive" behaviour; it is "second nature".

In so far as habits are "second nature" it would seem to be the case that they do not lead to patterns which conform to the principle stated above. Of course, there are habits and habits. Some of them may be so firmly rooted as to be almost unmodifiable, while some may be of a modifiable character. It is habitual for a housewife to buy milk each day. To buy three pints a day without modification might be regarded as a habit which has almost

<sup>1</sup> See Hobson, J. A., *Free Thought in the Social Sciences*, where he says that the principle does not apply to the artist. But surely the artist is the one who does know supremely well how to distribute his pigment!

<sup>2</sup> To the present author, the appreciation of this fact and its implications is that which gives greatest significance to Mr. J. M. Keynes' recent work on *The General Theory of Employment, Interest and Money*. The realistic tone of this book is due to the emphasis Mr. Keynes puts on the irrational elements in human behaviour. See, especially, those chapters dealing with the "propensity to consume" and "the state of long-term expectation".

ceased to be administration but to buy an average of three pints, varying from two to five or so shows that reflection is probably employed and in this case administration within a field of awareness takes place. In fact, much of the ordinary administration of means is conducted on these principles, not only in domestic administration but even in business administration the part played by habit is very extensive. It does not cease to be administration, however, and, therefore, rational—at least in part—if there is any deliberate variation. Within the limited field of awareness the principle then applies<sup>1</sup>

A further matter of economic significance on which our present analysis of the psychological background of pattern-making throws some light, is the group of conceptions known as the principle of substitution, the laws of supply and demand and the elasticities of supply and demand.

We have seen that the process of administering resources is the process of making time and space allocations of resources in accordance with the pattern of impulses acting within a field of awareness. In a social economy, where there are rights of property, this field of awareness is a scheme of exchange possibilities, as well as physical possibilities, realized in the mind. Fundamentally, there is no significant difference to an individual between commercial possibilities and physical possibilities, he makes his patterns, knowing that certain allocations involve his sacrificing other allocations by way of purchase payments, just as he makes his garden knowing that if he gives time in one direction he takes it from use in some other direction. Changes of prices in the market are like changes of physical possibilities to him and, within the new scheme of possibilities, he makes his new pattern. In the new pattern, as in the old, he makes his optimum allocation and, in this optimum allocation, the principle, given immediately above, operates: that is, the allocation is such that the resistance to any change of pattern is equal to or greater than the attractions of the change. The making of a new pattern implies a new balancing of attractions and resistances, and this is the basis of the substitution process.

Now the important point to note in this argument is, that when a new pattern is substituted for an old one because of changes in price or physical conditions or psychological dispositions, the only

<sup>1</sup> Habit and repetitive behaviour (not identical, since repetitive behaviour may be due to a repetitive desire such as hunger, which we do not describe as habit) are the conditions of whatever there is of stability in our economic system. They could, conceivably, assuming uniform physical conditions, make a stationary economy. They are probably necessary for the development of an ordered society.

thing we know is that it is made in such a way that the above principle operates. We know nothing whatsoever of the *absolute* magnitude of attractivenesses and resistances. all that we know is that in both cases, in the old pattern and in the new, marginal changes are such that resistances are equal to or greater than attractivenesses. Let us take an example.

Suppose I have been spending 5s. a week on article A and 5s a week on article B. We say that the marginal attractiveness of one expenditure equals the marginal attractiveness of the other expenditure and I do not spend 5s 1d on A and 4s 11d. on B because such a change would set up a resistance greater than the attraction. Now suppose that the price of A changes so that I spend 5s. 6d on article A and 4s. 6d. on article B. In this new situation the marginal attractiveness of my expenditure on A equals the marginal attractiveness of my expenditure on B. But there is nothing in the facts given which will enable us to say that the new marginal attractiveness of expenditure on A is greater or less than or equal to the old marginal attractiveness of expenditure on A. I simply move from one scheme of marginal equalities to another scheme of marginal equalities.

Substitution, then, is seen to be nothing more than a change of pattern and the coefficient of substitution elasticity which we discussed so fully in the last chapter is seen to be nothing more than a quantitative expression of the relationship between certain changes in the pattern and a given change in physical or price possibilities. The particular quantities that have been related to each other in economic discussions up to the present are changes in relative prices and the quantities of specified resources employed. But substitution as we have seen is a much wider conception than the changing proportions of two commodities or services used; it is the change of a whole pattern and involves the consideration of changes of proportions of *all* resources employed. In the wider sense we must regard as substitutional changes, the changes of quantities of bread and bacon consumed when the price of boots is changed.

We must now consider the so-called "law" of demand in the light of our analysis. The purport of this law is to express the relationship between the changes in the quantity of a commodity bought and changes in its price. Thus it is usually stated in this form: "the amount of a commodity demanded increases with the fall in its price."

The basis of this law is usually regarded as the law of diminishing utility. According to this latter law, successive equal additions to the quantity of any commodity, possessed or used by an

individual, yield diminishing increments of satisfaction. Thus, if a person consumes ordinarily  $x$  pounds of meat a week the  $(x + 1)$ th pound would give a lesser satisfaction than the  $x$ th pound as a rule. The law of diminishing utility is a special case of diminishing returns as defined in the second chapter of this section, the product being measured in "units" of satisfaction. If to a person's stock or usual flow of use successive units of a commodity are added, all other circumstances remaining the same, it is, of course, true that the increments of satisfaction will, beyond a certain point, diminish. The assumption of "other things" remaining equal is, however, an assumption that the increments are added at no cost to the person receiving the increments. The additions are made "from outside", so to speak, they are free gifts<sup>1</sup>.

When the "law of demand" is under consideration, however, we can make no such assumption. Variation in quantity demanded is here regarded as dependent on or a consequence of some change in other circumstances, the particular change being the change of price. A change of price of any commodity alters the whole scheme of possibilities; it creates a situation in which the relative utilities or relative attractivenesses of various quantities of resources are altered and this means that a fresh balancing of costs and advantages is made.

Though it would be absurd to say that the satiability of wants has nothing to do with the variation of demand with price, just as it would be absurd to say that technical requirements have nothing to do with demand and supply of a commodity yet it must be perceived that the change in the quantity of a commodity demanded must be regarded as part of the change of pattern as a whole brought about by the change of price. The "diminishing" utility of the commodity in question is only one item in the situation; other items are the utilities of other things. Thus, when the price of a commodity changes, the whole scheme of price possibilities changes and the purchasers move from one pattern to another. In many cases it is true that a fall in the price of a commodity causes an increase in the quantity of that commodity demanded, but it is conceivable and, indeed, it is an actual fact, that in some cases a fall in price may lead to a diminution of demand and a rise may lead to a rise of demand. If the price of bread were to rise it would not cause, in all homes, a reduction of the quantity bought,

<sup>1</sup> See Bullock, C. J., "The Variation of Productive Forces," *Quarterly Journal of Economics*, 1902. Carver, T. N., *The Distribution of Wealth*, ch. ii. Clark, J. B., "A Universal Law of Economic Variation," *Quart. Journ. of Econ.*, 1894. The variation of "utility" can only be discussed with reference to the variation of a single resource or the variation of money expenditure (variation of "shape" of pattern and "size" of pattern).

and the retrenchment in other directions may be such as to make it preferable to spend more of the impaired resources than before on bread. There is no law of demand; there is a variation of demand—by an individual or a group—which is dependent upon the price. In other words, demand is a “function” of price and for every individual and group there is an “equation” of demand.

Certain general features may be indicated with respect to the curve of demand. In the first place, if the price of a commodity is zero there is a finite quantity which will be demanded. If the price is infinite the demand will obviously be zero. Between these extremes the change of quantity demanded with a rise of price may be an increase or a diminution or it may be zero. Thus, at any point on the curve of demand there may be a condition of increasing, diminishing or constant demand. Another way of expressing this is to say that the “price elasticity of demand” may be positive, negative, or zero; this elasticity is the ratio between the change of demand and the change of price.

What we have said with regard to demand must apply equally to supply. It is sometimes said that when a pattern is organized in an optimum manner a rise in the price offered for any service in the pattern will lead to a rise in the quantity of service offered in the opposite direction or supplied. Thus, if the price offered is raised, the quantity of service sold will be increased. “the law of supply” is then, like the law of demand, of universal application.

In fact, it is not. It is, for instance, well known that a rise in the rate of wages offered will produce at times a fall in the amount offered and a rise in the rate of interest will similarly, at times, produce a fall in the amount of money offered for investment. The reasons are similar to those which we gave for the variation in response of demand to price. A change in price is a change in the physical circumstances within which the pattern is made and the amount offered will be such that the marginal attractiveness of its allocation in one direction equals or is greater than its attractiveness in some other allocation. Elasticity of supply may, like the elasticity of demand, be large or small, positive or negative.

Once more it is necessary to employ the conception of substitution. In the administration of resources men substitute one thing for another. At any given moment it may be said that a certain substitution will produce no change in the degree of satisfaction enjoyed. This ratio of substitution may be regarded as *the* substitution rate. When the optimum is attained the position with respect to any pair of resources is that the possible substitution ratio in either direction is less than that which is necessary

to maintain the same level of satisfaction, or, the marginal rate of desired substitution equals the marginal rate of possible substitution. To induce a person, therefore, at this point, to substitute A for B, it will be necessary for the price of A in terms of B to fall; and to induce him to substitute B for A it will be necessary to lower the price of B in terms of A. At the optimum point the actual rates at which resources may be substituted rise above the rates at which they must be substitutable in order that the same satisfaction may be retained.

Within a given price scheme or scheme of physical possibilities we have come to the conclusion that a person administering his resources rationally, that is, within a field of awareness of the various possibilities, will allocate his resources and lay his schemes so that he produces his optimum or most attractive pattern. This is often spoken of as administering towards a condition of maximum satisfaction. It will be clear by now, however, that a person administering his resources within a given scheme of possibilities may be conscious of some other pattern which would be more durable, had he the resources. He makes the best of his circumstances.

Physical possibilities are final—no man can overcome these. Property limitations, however, are not final. The pursuit of the maximum satisfaction, then, rationally conducted, may include activities directed towards the alteration of the property scheme, not simply by the ordinary process of exchange, but by the exercise of political rights and, in some cases, perhaps, by the exercise of force in rebellion. And, when all adjustments have been made within the field of awareness, even when adjustments have been made in the distribution of property by properly constituted political authority or by rebellion there still remains the possibility that men may create for themselves, or for one another, conditions that induce "blind instinctive" reactions. No final equilibrium in man's dispositions of resources is possible until there is perfect rationality of conduct.

To complete the symmetry of this section we may present a "pattern of living" in diagrammatic form which is of assistance in understanding the psychical aspect. Diagram GG is based on the figures employed by the Board of Trade in making its original index number of the cost of living. Returns of budgets were obtained and they were classified according to income levels. The figures used in making this diagram are the figures of actual amounts of various foodstuffs purchased. We have not used figures of all purchases merely, because the diagram would be too elaborate and its purpose is simply suggestive. The regular polygon

is produced by using the average figures for each item of all income groups as standards and reckoning them as 100 per cent. The irregular polygons, then, show the percentages of these average purchases of all the commodities bought by the various income-groups.

The striking feature of the diagram is the variety of rates of

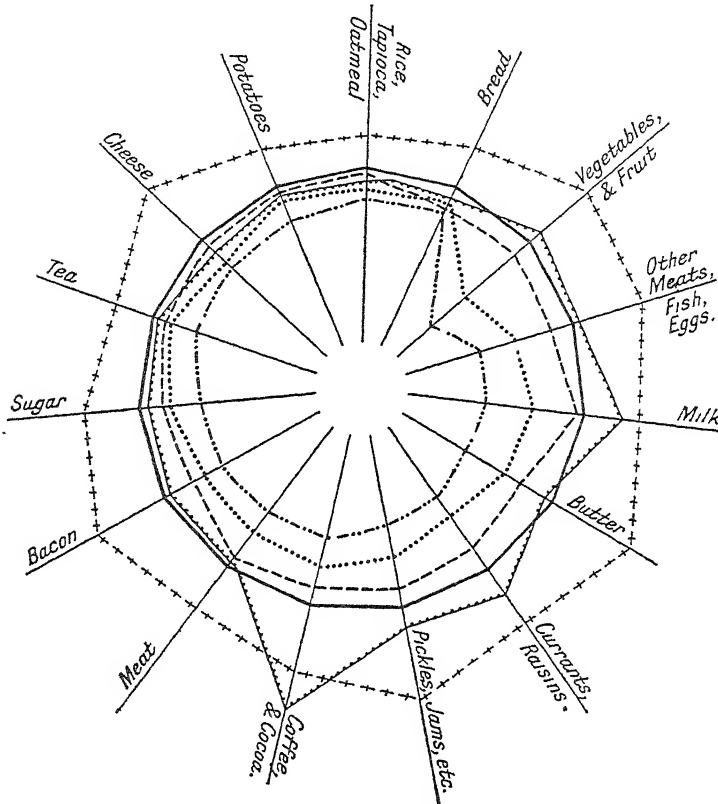


DIAGRAM GG

expansion of commodity purchases taking place when incomes rise. The point which is relevant here, however, is that the lines bounding the separate patterns are "marginal lines." If we can assume that these patterns are the best at the various income levels then there is an equality of psychical significance attachable to the marginal substitution quantities (say, the final pennyworths) in all directions. As income rises new *schemes* are effected (and,

of course, there would be new schemes if one or more *prices* changed). With each change the administrator moves along his lines of expenditure, backwards or forwards, until a new marginal substitution equality is obtained. (It would seem to be possible to calculate from these figures an income-elasticity of demand for the various commodities indicated).

We may now employ, as a means of making a general survey of the individual's process of administration within a price scheme,

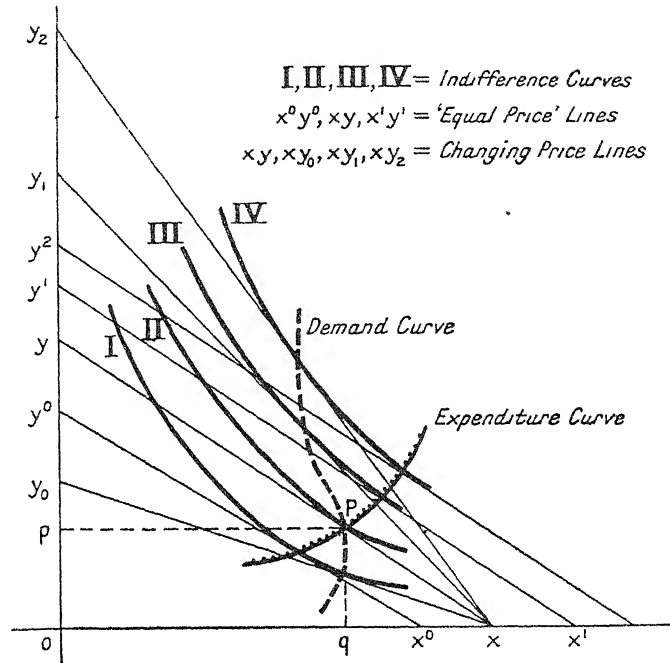


DIAGRAM HH

the device of indifference curves which we employed in the last chapter. To explain the process simply, we will consider a person possessing a certain amount of money and contemplating the purchase of a certain amount of a commodity or making an investment. We may, alternatively, consider the inverse position in which he possesses real resources and contemplates their sale. We will, in fact, consider the former case and use Diagram HH for reference.

Along the horizontal axis *ox* the administrators' money possession (or money value), is marked, and along the vertical



axis  $oy$  the commodity whose purchase is contemplated. The assumptions we make are that the money possessed is  $ox$  and the price at which the commodity (A) may be purchased, to any amount, is represented by the slope of the line  $xy$ . The purchase of A is the substitution of A for money and the amount of substitution effected will be indicated in the vertical distance from  $ox$  and the horizontal distance from  $x$ . Our administrator, for instance, may buy  $Pq$  of A for  $qx$  of money.

If, in fact, our administrator does decide that this substitution is best (that is, selects point P as the "combination point" of money and commodity possessions), it follows that the other points along  $xy$  represent combinations of lesser satisfactoriness. Traversing the line  $xy$  from  $x$  through P to  $y$  the degree of satisfactoriness is highest at P.

Following the procedure of our last chapter we may, now, insert lines of equal satisfactoriness (iso-satisfaction lines) as in a contour map. The point P must then be a point on one of these indifference curves at which the price line  $xy$  is tangential: at no other point on  $xy$  is the satisfaction so high.

We may interpret the decision in terms of this diagram by saying that at the point of maximum satisfactoriness the *marginal possible substitution price* and the *marginal desired substitution ratio* are equal, for at this point the tangent of the possible price curve and the tangent of the equally desired substitution curve coincide. If no exchange takes place it is because all the indifference curves represent lower degrees of satisfactoriness than that which passes through  $x$ , indicating money possessed.

With this contour map in mind it is possible to explain a number of reactions to certain changes in our administrator's position and, incidentally, explain the meanings of several terms employed by economists. As one writer has said, if one is provided with a person's "indifference map" one can explain all his reactions to changes of circumstances. Here we shall note two or three important reactions only.

In the first place, we can see the administrator's reaction to a change in the volume of resources possessed, assuming the price of A and other prices to remain stationary. To demonstrate this, all that is necessary is to draw a series of lines parallel to  $xy$ . (These are shown as  $x^1y^1$ ,  $x^2y^2$ , etc.). The parallelism of the lines indicates that they represent equal ratios of exchange. The varying lengths of  $ox$  ( $ox_1$ ,  $ox_2$ , etc.), indicate the varying quantities of money (capital or income) possessed. The points of tangency of these lines to the various indifference curves show the combinations of A and money which he acquires at these various levels of possessions.

It will be clear from this that if the percentage change of the quantity of A purchased is expressed as a ratio of the percentage change of money possessed we have a measure of the elasticity of demand for A with respect to changes of possessions. The possessions may be capital possessions or income administered. When expressed in terms of income this elasticity of demand is known as *Income-Elasticity of Demand for A*; in terms of capital it may be called *Capital-Elasticity of Allocation* on resource A.

The second situation which may be described by reference to this diagram is the effect on our administrator's demand for the commodity A when the price of A is changed, income remaining fixed. This is shown by drawing a series of lines  $xy$ ,  $xy_1$ ,  $xy_2$ , etc., revolving on  $x$ . The points of tangency of these price lines and various indifference curves denote the quantities of A purchased when price changes, and again, it is clear, an elasticity of demand with respect to price is calculable. The percentage change in the quantity demanded expressed as a ratio of the percentage change of price is the measure of this *Price-Elasticity of Demand*; it applies to income or capital allocation.

The indifference curves themselves give, at any point, the *ratio of marginal substitution* which leaves the administrator in the same position as regards satisfactoriness. This ratio at any point is the tangent to the indifference curve at this point.

When a change in the price of a commodity takes place it is clear that the administrator experiences a change in the quantity of resources which he possesses or of the income which he enjoys. He is, as we explained in discussing the physical possibilities of production, made more or less free (or restricted) and rises (or falls) from one indifference curve to another, mounts or descends the "hill of satisfactoriness". In doing so he may be described as moving along the indifference curve on which his original optimum point was placed, and then mounting up or down, to buy more or less as the result of his increase or decrease of means. He may, of course, buy the same amount using the whole of his increase of means for the purchase of other commodities, or restricting to the extent of his decrease of means, wholly, in these other directions.

This analysis shows that the change which a person makes in his purchases, when his income or capital changes or when the price of the commodity changes, depends upon a variety of circumstances. It depends upon the shapes of the indifference curves (the changes in the ratios of substitution along iso-satisfactory lines), the original price and the new price of the commodity he is purchasing, the amount of income or capital from which he starts and the ratios of substitution of other commodities for money—

other indifference curves involving other commodities. It is of universal validity, applying equally correctly to satisfactory adjustment measured in financial units, psychical "units" or physical product.

As regards the conditions of equilibrium the device of indifference curves shows that there is one universal rule which applies. In all cases equilibrium can only be attained when the marginal substitution makes no difference to money value, satisfaction or physical product and this, being interpreted, means that any extra-marginal substitution or infra-marginal substitution (or purchase) yields a smaller total money value, a lower degree of satisfaction or a smaller quantity of physical product. In other words, in equilibrium, the condition of diminishing rates of marginal substitution holds. The lack of coincidence of the price line and the indifference curve except at a point indicates this fact, if these lines coincide at more than one point there is more than one optimum point and this we assume impossible.

Still considering this "contour map" of indifference curves as representing the mind of a purchaser there are several other conceptions which it elucidates. In the first place, the line joining the points of tangency of parallel price lines and indifference curves, is called the *expenditure curve*; this line shows the amount of the commodity bought, as income or capital changes, and the elasticity of this line is *income or capital elasticity of demand*. In the second place the line joining the points of tangency, of the price lines revolving on one point along the axis  $ox$ , is the *demand curve*, showing the variation in the quantity of  $A$  bought as the price changes. The elasticity of this line is *price-elasticity of demand*, when the elasticity is measured as the ratio of the change of  $Pq$  to the change of the ratio of  $qx$  to  $Pq$ . The indifference curve through any point indicating the combination of commodity and money possessions at any given moment (or through a unit period of time) is a substitution curve and traversing this line shows the maximum amounts of money which the administrator will give for stated quantities of goods (or the minimum amounts of goods which he will accept for stated amounts of money). It is a *maximum price curve* and its elasticity is the *elasticity of substitution*.

Since substitution implies an exchange, it is clear that the apparatus which explains a purchaser's reactions to changes of conditions also explains the reactions of a seller. The seller is one who substitutes money for his commodities. Supply curves and minimum selling price curves are derived in comparable manner and so the ordinary apparatus for discussing price determination is constructed from the apparatus used for explaining an administrator's reactions to price, as a purchaser and as a seller.



SECTION IV  
*THE PRICE AND INCOME STRUCTURE*

CHAPTER I  
INTRODUCTORY

This section, like the last, is a study of one part of the scheme presented in Diagram M. In the last section we studied the administration of the resources of particular controlling units, considering how men deal with their physical and market circumstances to attain physical, financial, or psychical ends. In this section we are concerned with the ratios of the *flows* indicated in the diagram. We shall not concern ourselves with the donative flows, voluntary or compulsory, leaving these for consideration in the last section, we shall consider only the contractual flows.

The administration of resources, we have already repeatedly shown, is a process of substitution. Ever since man began to use resources he has weighed one situation against another and has made his choice. In making his choice he has substituted and in making his substitution he has established ratios of substitution. Establishing *actual* ratios of substitution we have seen to be a process of selecting from *possible* ratios of substitution and we have gathered, in our study of substitution, that the process of exchange between two or more persons is but an extension of the process. Exchange ratios or prices are, therefore, simply substitution ratios, a species of a large genus.

The price and income scheme or structure of a community is, then, a scheme of substitution ratios. It is not the whole scheme in existence but its relationship to the whole is such that a study of it reveals much of what there is to be known of the whole. The forces that determine the scheme of exchange substitutions are part and parcel of the forces determining all substitution ratios that are established.

There are two aspects of the price and income structure to which it is important to direct attention. In the first place it must be regarded as the product of men's administration and, in the second, it must be regarded as a condition of this administration. We have dealt with the second aspect already in the last section and the

present section will be devoted to the first. The discussion which we present in the following chapters is by no means an exhaustive study of the price and income structure for it is our purpose rather to present a picture of the system and exhibit a few of the outstanding features of which detailed discussion is found elsewhere in the voluminous literature of economics. The course of our presentation is, indeed, very simple.

In the first place we present the price scheme as one manifestation of the forces of attraction and counterattraction felt by individuals with respect to the allocation of resources belonging to one another. We show the conditions of equilibrium of these forces in so far as they can be expressed in terms of price. In other words, we discuss generally the determination of price and income. The contrast between the conceptions of those writers who attribute price determination to labour of production and those who attribute it to utility or desiredness of patterns is expounded and, in the process, the identity of price determination and income determination is revealed.

In the second place, we demonstrate the uniqueness of every price showing that it is the expression of the terms of a particular contract differing in some way or other from every other price. Having done this we then proceed to show in what way prices may be compared and pass on to a discussion of the conditions of equality of prices. This we find involves a further consideration of the great economic principle of substitution and, incidentally, we form a conception of a market of varying degrees of perfection.

In our discussion of income we again contrast the older and newer treatments of economists and we direct particular attention to the conceptions of earned and unearned incomes that were so prominent in the earlier works. We show that "economic rent", a "surplus" income, is rejected by the authorities of to-day who emphasize the conditions of general equilibrium of attractions and counterattractions but we also attempt to show in what way the conception may be retained and the value of it in understanding the distributive system. This value lies in the possibility of its revealing the extent to which monopolism exists. We show that the difficulty of understanding it lies in a confusion of costs and expenses, in one way by the earlier economists and in another by the later economists.

In the fourth chapter of the section we consider several general relationships amongst prices, in particular, the relationship between capital and service prices, through interest, the relationship of factor and product prices, and finally the relationship of complementarity and competitiveness. These relationships

reveal in a particularly emphatic manner the unity of the price and income structure

The final chapter discusses certain aspects of the question of whether or not the exchange system does, in fact, ever approach a condition of equilibrium. The position which we expound is that while there is a constant tendency on the part of men to administer towards an equilibrium there are certain features within the system at any moment which cause them to move into disequilibrium, for a time at least, so that the actual equilibrium towards which they move can, perhaps, best be considered as an oscillating equilibrium. Lastly, we show that the dynamic elements in the system, the changing nature of economic data, lead to a continual dislocation of administrative schemes. Fluctuations and dislocations, we conclude, are apparently inherent in an economic system in which change is present and administration is conducted under a system of private enterprise and exchange.

## CHAPTER II

### THE DETERMINATION OF PRICE

Price is the ratio between two quantities of things exchanged. The real things which men exchange are freedoms to use resources, but the resources themselves are regarded as embodiments of these freedoms and when exchanges are effected the terms of the transactions are quantities of physical resources and the ratios are the prices.

Since price arises out of exchange it follows that the cause of price is the cause of exchange. Whatever leads men to exchange leads them to establish a price or ratio of things exchanged. Price is automatically registered as an exchange is effected.

An act of exchange is a double act of substitution. When a person A exchanges a coat for forty shillings with B, A gives up the coat and substitutes the money, while B gives up the money and substitutes the coat. The circumstance that leads to this double substitution is that A thinks it worth while to give up the coat for forty shillings and B thinks it worth while to give up the money for the coat. The terms of the transaction must be such that both parties think them worth accepting.

The description of exchange as a double process of substitution suggests at once that the exchange of properties between two persons is simply an extension of the substitution process whose principles we examined in an earlier section. We have shown that the whole process of living is a process of substitution and we have shown that the process of substitution is a process of giving up one pattern of resources (or, if we prefer to say so, giving up one quantity of resources) for another. Thus, even when an isolated person is administering his resources, he is making prices.

The first price maker was Adam—assuming that he was the first man—and he made his first price on the first occasion when he consciously decided that of two courses of action that were alternative to him, one was preferable. The price he paid was the ratio of what he gave up to what he acquired. So, if his decision lay between gathering a stone of apples and fetching a gallon of water and he chose to fetch the water, the price he paid was one stone of apples for a gallon of water.

Though it is admitted by all schools of thought, and always has



been admitted, that the cause of exchange is the worthwhileness of the transaction, it has been suggested by practically all economists at one time and by some even to-day that the precise terms upon which an exchange is effected are determined by something else. This something else is labour and the theory of these writers is that the prices of things are proportional to the quantities of labour embodied in them by production activities

The fundamental fallacy of this theory is that man buys from Nature in the first instance by the payment or exertion of labour. Nature is regarded as a great shopkeeper who sells her goods only on condition that man pays with labour. Now the fact is that Nature *gives* to man everything he has, including his labour, and man is free within certain limits to rearrange the gifts of Nature as he likes. In order to rearrange things man must employ his labour, but the employment of labour does not mean "giving it back to Nature"; it means employing it in one way rather than another. The cost of gathering the water was, to Adam, the sacrifice of the apples, and the price of the water was "apples per gallon".

That labour is not the determining factor in price making we can show by a very simple illustration. Let us suppose that a person cultivating his farm expends ten units of labour on each of two fields. In the one field he produces twenty units of potatoes and, in the other, thirty units of potatoes. The potatoes, we will say, are of the same quality. No one will suggest that the value of twenty units of potatoes and the value of thirty units are equal and yet they have "cost" the same quantity of labour.

Not only does this example prove that the values of the products of equal quantities of labour are not necessarily equal but it turns the tables completely on the labour theorists and shows that equal quantities of labour are not worth the same either in the market or to an individual himself. Suppose a government official were to come along to our isolated farmer and order him to serve ten units of labour time in the army. Would our farmer say it was a matter of indifference which of the two units of ten he gave up? Obviously not. He would give up that ten which represented twenty units of potatoes rather than that which yielded thirty. The value of labour is the value of what it produces.

The process of substitution either in internal administration or in the form of exchange between two persons is a process that can only take place as a result of the weighing of advantages. It is inconceivable that it should be otherwise. Substitution involves the making of a decision and a decision can only be made by reference to the alternative satisfactions from which choice must

be made. That "an hour of glorious life" is better than a "cycle of Cathay" is a profound truth. we do not measure advantage in time; we value time in advantage given.

Granted, now, that the process of substitution, including the process of exchange, is a process of weighing advantages, can it be said that if a person spends ten shillings on meat he gives up an amount of satisfaction which is equal to the satisfaction he acquires? Is the utility of ten shillings equal to the utility of meat?

The answer to these questions is, obviously, that the two utilities are not equal. if they were it would be natural to ask why they should be exchanged. There can be no advantage in exchanging equals and since exchange only takes place because it gives advantage, it follows that the utilities are not equal. To the one who buys the meat, the meat is more useful than the ten shillings. to the one who sells the meat the reverse is the case.

The solution of this difficulty we have already suggested in our study of internal administration. We may recall it by reference to Adam and his water and apples. If Adam decides to collect a gallon of water rather than gather a stone of apples and so fix his "price" at one stone of apples per gallon it is clear that he prefers the water to the apples and its total utility is greater than that of the apples. But he can vary the quantity of apples and the quantity of water and this he presumably has done in his mind in arriving at his decision to balance these quantities against each other. We can imagine him weighing the satisfaction of a pound of apples in his mind against the small quantity of water he could collect during the time released, two pounds, three pounds, and so on. In other words we can imagine him weighing increments of water against decrements of apples until a point is reached when the satisfaction of his water increment only just balances the satisfaction sacrificed through the decrement of apples. He makes his decision where the marginal substitution quantities are equal in satisfaction giving capacity. Marginal cost and marginal advantage are equal when he gives up fourteen pounds of apples for one gallon of water.

The only difference between Adam buying water with apples from himself, and buying water with apples from some one else is that in the former case he knows exactly what substitutions he can make. He knows that if he reduces his apple collection by a given amount it releases a certain amount of time during which he can collect a certain known quantity of water. In bargaining with another person he does not know what substitution he can make, he has to play for position as, indeed, does the other person.

If, however, he is placed in a position to bargain with another

person, we can easily imagine that the process would begin carefully. It is more likely that the first suggestion would be one which would be easily acceptable to both sides, but if it did not create a completely satisfactory position, that is, if on the first exchange each thought he would like to proceed a little further, it is probable that they would do so. The bargaining would proceed step by step until only a small transaction would be possible. At the last step the position would be such that both would be virtually indifferent to it.

Bargaining between two persons in commodities that are infinitely divisible is a process, then, in which both parties tend towards a situation in which the marginal substitute quantities are equal in utility. Let this situation be such that the last substitution is 4 oz. of apples against a quarter of a pint of water. To both parties the utility of 4 oz. of apples equals the utility of a quarter of a pint of water. We have already shown that in such a position the ratio of the marginal prices of apples and water is the same as the ratio of their marginal utilities, *to both parties*.

The case we have just considered may be taken as typical of every exchange transaction in the economic system. The price scheme is a mass of individual ratios and on each side of every transaction is a person who weighs advantages. Thus, in every case, when an exchange is effected, they who effect it try to establish such a position that the utility of the last unit given up is equal to the utility of that which is thereby acquired. The marginal substitution gives neither advantage nor disadvantage. In other words, in a condition of equilibrium of price, the marginal prices of things are proportional to their marginal utilities, *to both parties in every transaction*.

There are two cautions to be observed in interpreting this general pricing law. In the first place the ratios which are equal are the ratios of marginal prices and marginal utilities. This is not the same thing as saying that the ratio of actual prices at which totals are exchanged (i.e. average prices) is equal to the ratio of marginal utilities or total utilities. In the second place, the ratio of marginal prices is the same as the ratio of marginal utilities to both parties in a transaction, but this does not mean that the marginal utilities to different persons are equal. It only means that the ratios of the marginal utilities are equal, to each party.

In the case of our isolated pair of persons exchanging apples against water there is a feature of the transaction which is not typical of all prices. We refer to the matter of determinateness. Since neither party knows what the other is prepared to give or

accept it is clear that both negotiate for position the only knowledge they have is the knowledge of the satisfactoriness of different exchanges to themselves. They will, for example, both know the maximum amount of their own commodity which they are willing to give up for a given amount of the other's, so there does exist in the situation a couple of schedules of supply or demand, a couple of series of maximum offer or demand prices or minimum acceptance or supply prices. That there will be only one point at which both will exchange is extremely improbable: the most likely condition is that there is a zone of possible exchanges, we may call this the zone of indeterminateness.

The existence of this indeterminate zone of possible prices does not mean that the parties cannot reach an equilibrium, but it does mean that there are several possible equilibrium points; their offer and demand schedules are not such that there is one and only one point at which they can exchange. It also means that the particular point of equilibrium on which they alight depends upon the initial move made by one of the parties; it depends upon their relative bargaining skills. To define bargaining skill is difficult, but it would seem to mean the capacity for creating a certain impression in the mind of the person with whom one is bargaining, that certain offers are the best that can be expected. The equilibrium is established in the field of imagined offers and demands rather than in the field of stated prices.<sup>1</sup>

We must now leave the case of an isolated exchange and consider the process of price determination when there are several or, indeed, many people buying and selling. It is clear that the difference made to the pricing process by the expansion of the number of people in trading relations is simply one of widening the field of possible substitutions. We say "simply" though, in actual fact, this widening of the field of transactions produces an extremely complex situation. Men may produce different kinds of commodities: they live in different places so that the locations of their transactions are scattered; they require things in different places, in different quantities. Their tastes vary and their physical capacities vary. Goods may be supplied monopolistically or under competitive conditions. Buyers may be monopsonists or competitors.

We must envisage the price scheme as a mass of individual prices, ratios in which quantities of money are being transferred in return for quantities of things, every transaction taking place between two persons. The prices may be grouped in various ways. We may, for instance, think of all the prices into the

See Wicksell, K., *Lectures on Political Economy*, 1, pp. 49 to 51.

making of which one particular individual enters : we may have a person buying from several sellers or a seller selling to several buyers. We may think of all the prices into which a single commodity enters and so we may have butter prices, coal prices, and orange prices. We may consider prices that are transacted in a certain place and so we may have Newcastle prices and London prices. The theory of price is required, as part of its function, to state the relations amongst prices and groups of prices

If we assume at any given moment that the community's pricing system is in equilibrium there are certain conditions which we can lay down as essential. Some of them we know from our study of isolated exchange.

In the first place every individual will be producing and selling such quantities of a commodity that the marginal revenue which he receives from the sales is equal to his marginal cost. In the second place, if he is selling to more than one person, his situation will be such that his marginal revenue from each person is equal to the marginal cost of supplying that person and it will not pay him to transfer a unit sale (make a marginal transference) from one buyer to another. As we have seen above this does not mean that he is, of necessity, selling at equal average prices, the condition of equilibrium is marginal equality of costs and revenue in his exchanges, with individuals and with the whole group of buyers together.<sup>1</sup> It does not even mean that his marginal prices, as we have defined prices, shall be equal since the marginal cost of supplying a person one hundred miles away may include transportation costs. If the goods are sold "ex farm" these costs will be absent.

Whether or not he is able to charge different prices to his customers depends in part upon their demand curves or schedules. It is possible that under certain conditions he can attain his maximum satisfaction by charging the same prices to them all, even if he has the power to differentiate. It may be, however, that he must charge equal prices since competition is so keen against him that if he attempts to differentiate he loses the customers against whom he differentiates. The prices he charges are bound to be kept in relation to the prices at which his customers can obtain goods elsewhere, the relationship being determined by their costs of substitution.

If we consider an individual buyer the situation is precisely analogous. A buyer may buy at different prices from different sellers or he may buy at the same price. Competition amongst

<sup>1</sup> Robinson, Joan, *Economics of Imperfect Competition* Chamberlin, *Monopolistic Competition*.

buyers and sellers and the nature of his own demand curve as compared with the curves of others will determine his freedom in this direction

In every exchange transaction the amount of a commodity bought is obviously equal to the amount sold. When the exchange system is in equilibrium the amount bought is still equal to the amount sold but we must add the additional qualification that nowhere in the system can any person increase to his advantage either his sales or his purchases. neither can he decrease the quantity bought or sold to his advantage. The situation is such that the motives, that lead to such substitution as involves an increase or diminution of the quantity bought and sold, have ceased to operate. This position is sometimes described by economists as one in which supply is equal to demand and it is also sometimes stated that the function of price is to equate supply and demand. The expression is sometimes further elaborated into a declaration that the function of price is to ration scarce commodities.<sup>1</sup>

There is no necessity to disagree seriously with these statements, but our approach to the study of price in this chapter would lead us to describe the situation rather differently. Price is not the determinant of the equalizing of supply and demand nor is it the determining factor in distributing resources. it is itself the determined ratio. Price is a manifestation of the rationing or equilibrating forces. it is primarily a result. It is the function of exchange, a particular form of substitution, to ration supplies or balance supply and demand, and in performing this function prices are created.

The "picture" of the pricing system which we wish to present here, then, differs somewhat—perhaps in an unimportant way—from that which is usually presented. The common picture is of men supplying "markets" of various kinds, our picture is rather one of a vast and intricate system of transactions. The central feature of the system is an individual administering his own property in the first place, and, in the second, attempting to substitute the properties of other people for his own. These other properties exercise their attractions over him and he weighs these attractions against the counterattractions of things he might be called upon to sacrifice by the owners of these other properties. The ownerships are transferred as the result of pulls and counterpulls and every transaction is an act of substitution.

The "size" of the pricing system is determined by the number of transactions that are in any way connected, immediately or remotely. in these days it is virtually world wide, for all

<sup>1</sup> Cf. Cassel, G., *Theory of Social Economy*, 1, 3.

communities are in some sort of trading relations with one another. The substitution activities of every individual in the system must be regarded as affecting and being affected by the substitution activities of every other individual, sometimes, perhaps, very slightly and sometimes appreciably, the price of eggs in a London shop is related to the price of a theatre seat in Capetown. The interesting problems in price theory are the problems presented by the varying degrees of responsiveness that one transaction or set of transactions shows to a variation in another

Another condition of a general equilibrium must be that no person can offer a better transaction for any transaction taking place within his knowledge. If I see a person buying a coat for 40s and the pricing system is in equilibrium (and, consequently, so am I) I shall not attempt to substitute my purchase of that coat since I shall not consider it worth 40s. If, however, I think the coat worth 45s and I see it being sold for 40s I shall move to substitute my money for the other purchaser's; in this case I am not in equilibrium (nor is the pricing system)

A corollary of this principle is that, in equilibrium, things which are capable of giving equal satisfaction to any individual will have the same price "marked" upon them, if the prices are different then this person will buy the given quantity of satisfaction at the lower price. he will substitute. The condition of equilibrium is that "arbitrage" transactions are not possible

It must be noted that equality of prices exists when commodities are perfect substitutes. It is possible, of course, that commodities may be imperfect substitutes. In this case the equilibrium condition is that the prices are related to the cost of making them substitutes. If eggs are twenty-four for a shilling in London and twelve a shilling in Liverpool the difference can only persist if the costs of transportation are so great that it does not pay to move the cheaper eggs to the dearer place. Whenever the costs of substitution (transportation, manufacture, waiting, risking, persuading by advertisement or salesmanship) are less than the difference between the prices of two things which may be substituted, there is a lack of equilibrium and substitution takes place until there is equilibrium. In this case the costs of substitution are equal to or greater than the difference in price—to every individual who knows of the transactions. When costs of substitution are nil we have a case of perfect equality of price

When transactions are perfectly substitutable we have a perfect market. A market is a group of transactions and a perfect market is a group of transactions which are perfectly substitutable. If transactions are perfectly substitutable the position is such that

not one single buyer or one seller can "stiffen" terms upon which he exchanges and none of them can offer "easier" terms. If any of them stiffens his terms his transaction is completely wiped out; if any of them makes his terms easier he is embarrassed by a crowd of dealers offering his terms. In a perfect market each buyer is in perfect competition with other buyers and each seller is in perfect competition with other sellers.

We have spoken of a perfect market. What can be meant by an imperfect market? In a perfect market any seller or buyer attempting to stiffen his terms, attempting to pull a larger quantity of payment for his goods or goods for his payments, finds himself with no transaction at all, completely eliminated. An imperfect market is one in which he can pull to a certain extent, in which he can stiffen his terms to a certain degree and not lose the whole of his transactions. In other words, his transactions can be *partly* substituted by others. An imperfect market is a group of transactions in which some of them may be partially substituted for others or in which a buyer or seller may lose part of his trade if he makes his terms harder. In an imperfect market, then, there is imperfect competition.

With the conception of a market which may vary in degree of "perfection" we can now proceed to consider the relationship between costs and returns or costs and advantages. Both costs and advantages are psychical phenomena and, therefore, they are subjective. Hence, we can only consider their balancing in an individual's case. We will consider first a seller and then a buyer.

A seller in a perfect market we have shown to be in such a position that if some individual buyer attempts to harden his terms the transaction with that buyer is at once eliminated. This means that the seller can at once deflect *the whole* of what he is selling to this buyer to some other use, to some other buyer or to his own personal use. If he can do this it is clear that his alternative use of these resources is exactly equal to the use he is making of them in this particular transaction. In other words, what a person receives from a buyer in a perfect market is simply an exact equivalent of what he can receive elsewhere. Costs and advantages are, then, in a perfect market exactly equal. If our seller is selling ten loaves for 2s, in a perfect market, the 2s and the ten loaves are exactly equal to him in the sense that if one buyer does not give 2s, another will, or, if we wish to think of the resources employed in making the loaves, their alternative use is also just worth 2s. In such a case marginal cost and average cost of supplying the bread are equal. The same reasoning applies to a buyer in a perfect market. What he receives is just equal in satisfaction to



what he gives up. This is the meaning of the declaration that in a perfect market a person receives exactly the value of what he gives, neither more nor less

Even if the imperfection of the market consists of monopolism on the side of the sellers only, the buyers being in a state of perfect competition, the price which a seller receives from any particular buyer is only just equal to the value of that which he sells since, competition being perfect amongst the buyers (that is, substitutability of one buyer for another being perfect), the seller can transfer his goods to another person if any particular buyer tries to harden his terms. And so, if there is perfect competition amongst sellers, and buyers are monopsonistic, then the sellers again receive as payment something which is, to the sellers, the exact equivalent.

When, however, a person is in a condition of imperfect competition the exact equivalence of cost and return does not hold. If he stiffens his terms he does not close down the whole transaction: he modifies it. The only equivalence of cost and return in this case is *at the margin*. We thus return to our original position. In a state of equilibrium of prices, every person, in every transaction, exchanges so that his marginal cost and marginal return (in satisfaction or money) are equal, supposing fine adjustments possible, but when competition is perfect, not only are marginal costs and marginal returns equal but so also are average costs and average returns.<sup>1</sup>

In our discussion of isolated exchange we showed that the equilibrium established between the contracting parties was indeterminate. In the subsequent discussion we have shown the significance of determinateness and indeterminateness. If we consider a single exchange transaction we may think of it as modifiable to varying degrees: the conditions may be such that it may be changed or eliminated. If any change in supply or demand conditions is attempted the complete elimination of the transaction indicates a perfect determinateness: the exchange transaction is this or no other. If a change in supply or demand conditions leads only to a change of the transaction, but not to its elimination, the equilibrium is not rigid but flexible. Perfect competition then gives a rigid equilibrium of prices while imperfect competition gives a flexible equilibrium which is sometimes regarded as indeterminate.

We must now turn to the consideration of price determination in a capitalist economy. This expression is ordinarily employed to represent an organization in which tools or machines are used, things made by man for the purpose of producing consumable goods. Strictly speaking it is impossible to live without employing

<sup>1</sup> Robinson, Joan, *op cit*

capital equipment, without employing things because they are a means to an end and not because they give direct satisfaction. The production of tools is simply the production of these indirect agencies of satisfaction.

Fundamentally, the characteristic of our present organization is not that man employs means of production or even that he produces means of production: it is that he organizes his resources *through time*. If man could not see into the future it is very certain that he would not produce for the future and the "roundabout" method of production so extensively employed would not be employed at all. Seeing into the future, he realizes that certain wants, of himself and of others, will arise and he sees certain chains of possibilities of satisfying them. From these possibilities he makes his choice. Since capitalism is the administration of resources through time, it follows that the significance of capitalism to the pricing system is the significance of time thereto.

Now some writers assert that the significance of time in man's use of his resources is that it makes an increase of production possible. If coal is required to be dug, a greater rate of output can be obtained by making machinery than by working with the hands. From this it is argued that the use of time in production increases the physical product and in this phenomenon is the secret of *interest* which is the principal pricing phenomenon that arises from the time feature of our organization. Resources that are used through time produce interest.<sup>1</sup>

It is difficult to see how time may be regarded as a producer of anything. Time is not a resource: it is a dimension, like space, and it would be as legitimate to speak of the productivity of space as to speak of the productivity of time. Things derive their significance from their spatial and temporal juxtaposition, but both space and time are abstractions: we do not use them as factors. We measure distance, area, and volume in spatial units and we measure durability in time units—but we cannot speak of space and time as resources. We cannot, for example, as one writer suggests, imagine an economic paradise in which all goods are free—abundant—*except time*, any more than we can imagine another paradise in which all goods are free except space. If all goods are infinitely abundant, so are space and time in which they exist. We can quite as easily imagine a universe in which there are miles and miles—of nothing<sup>2</sup> as we can imagine years and years of nothing.

<sup>1</sup> Cf. Bohm-Bawerk, *Positive Theory of Capital*, Bks. vi and vii. Wicksell, K., *Lectures*, pp. 147–157. Jevons, W. S., *Theory of Political Economy*, pp. 266–7.

<sup>2</sup> Rodan Rosenstein, *Rôle of Time*. M. Rodan Rosenstein is aware of the impossibility of time alone.

If time is not a resource, but is simply a dimension of resources, it follows that the physical productivity of the "roundabout" process is not due to its time duration. The mere prolongation of time taken is not a means of increasing the productivity of means. Means increase their productivity by being shifted in time and space but not through their consumption of either.

Time location is important in valuation. A smoke after a meal is more desirable to most people than a smoke before a meal, an *apéritif* on the other hand is more desirable before a meal. In the former case, other things being equal, a person would pay, at the present moment, more for a post-prandial smoke to-morrow than for an ante-prandial smoke, but he would pay more for an ante-prandial *apéritif* than for a post-prandial one. There is no principle which we can lay down with respect to men's preferences in the matter of simple time location any more than we can say that men prefer all things near to them or further away. The "pattern" dictates desirable locations.<sup>1</sup>

Physical quantity of a commodity is not a measure of value. It follows then that a device for making a larger quantity of a commodity is not necessarily a device that will be adopted. Physical production is not economic production and the "greater efficiency" of the roundabout method—or, more generally, the employment of resources through time—is not a "physical" efficiency.

When the roundabout method is employed its employment is due to the prospects of the product being more worth while than the employment of resources directly. But when resources are used directly it is because such employment is more worth while than their indirect use would be. There is no such thing as "physical efficiency" as we have already seen in our chapter dealing with the physical aspect of administration. The choice which men make between a roundabout and a direct employment of resources as physical processes is the same as the choice between two fruit trees, a large "producer" and a small one. That is chosen which gives the greater satisfaction and not the greater quantity of fruit necessarily.

This discussion is not a denial of the significance to human living of the technical difference between roundabout methods and direct methods of resource employment. The variety of things enjoyed and their quantity are due to the greater freedom given by machines and other intermediate resources produced by man. Nor is it a denial of the fact that the variations in the quantities and varieties lead to variations in the particular prices in the

<sup>1</sup> Knight, F. H., *Risk, Uncertainty, and Profit*, p. 136. Time is a quality "like . . . beauty."

system. It is a denial of the assertion that any change in the principles of valuation are introduced by them. If there is any particular feature of the pricing system due to time it is not due to the physical productivity of production goods

We have said that time is simply a dimension of men's patterns of living, a mode of describing juxtapositions of things. If this were the only feature of it, the relationship of time to the pricing system would, in a state of equilibrium, show itself in the relationship of production goods prices to the prices (*a*) of the resources employed in their production and (*b*) of the services that such goods produce in the future, in a very simple manner

Under such circumstances the money for which a capital, production, or intermediate good would exchange would, at the moment of its production, be equal to the sum of the amounts of money paid out in the process of production and, at that same moment, it would be equal to the sum of the values of the services it would yield in the future. The first position would be precisely analogous to the addition of transportation charges to the value of a commodity being carried through space and the second position would be analogous to a person about to go on a holiday taking an amount of money equal to the sum of the amounts he expects to spend. Actual experience shows, however, that the relationship of the values of things in the future and their values in the present is not so simple as this

The difference between capital value and rent, two prices, one of a service and the other the present value of a service, is as old as the hills. Even in the early days when interest was forbidden on loans of money rent on real property was allowed. All things which are durable in service have their present values derived from their anticipated service values. There must, then, ever since there have been these two prices, have been an *agio* between them, a method of tying them together.

But not only have durable, real things, in the ordinary sense, streams of anticipated service values issuing from them through time, but so have many of the so-called perishable commodities. The meal one eats to-day has a future significance, so has the concert one visits or the holiday one takes. There has been in all economic theory a too easy assumption that there are services which "perish in the moment of enjoyment". The realization of their significance may fade away as time proceeds but, when they are future, before their stream has run, they are seen to exist. The current resources, the immediate enjoyment or satisfaction sacrificed for future production, is rather over-emphasized. It is nearer the truth to say that present satisfactions given

up are really streams of future service and, consequently, when "present goods" are used for "future satisfaction" we have already employed the *agio* of interest, the discount rate that produces a present capital value from the future service value. And the future "services" themselves are also, in value, the capitalized value of the streams of services which issue from them, streams of streams of service, *ad infinitum*. A discount rate is essential to give a present value.

If there were no discounting of the future values of services, the present value of any capital resource, whether man made or not, would be the sum of future service values. In this case, one can imagine the value of a £5 interest payment in perpetuity by a government: its capital value would be "infinite" and the promise of the government to pay it would be forthcoming only if an infinite loan were made! The value of a house would be the sum of all rents while it lasted and the prices of the factors would be increased accordingly. It would, in fact, be an impossible world. In order to administer through time it is necessary that capital values be estimated. Without a limit to the resources at our disposal we cannot administer. If life were perpetual and there were absolute certainty we should have a condition of things beyond our control; life would be just being.

The estimation of future values at less than present values makes possible the calculation of capital values. It makes possible the valuing of a natural resource which has no "saved up labour or saved up land services" embodied in it and it makes possible the valuing of a resource *to be made* in the future, this latter possibility making a further possibility—the calculation of the costs that are worth while in producing "capital" goods.

In an economic system maintaining a perfect equilibrium through time the rate of discount would need to remain constant. The ratio of service value to capital value, the ratio between rent and capital value, between present and future values would be constant and, therefore, the return on resources would remain a constant percentage both measured in value. The value of capital goods would be, at the point of their finished construction, the value of investment with interest accrued at compound rate and this would be equal to the sum of the discounted future service values, discounted also at compound rate. The value of partially completed goods would be the amount invested up to date at accrued interest or the discounted value of the goods when completed, discounted further for the period to run before completion, less the discounted amount of investment to be put in before completion. The value of partially used resources would be the investments made in production,

with accrued interest, less the value of the services already used with interest on them from the time of completion of production; this would equal the remaining use values, discounted at compound interest. Things that were perfectly durable in service-yielding capacity (measured in values) would remain, in an equilibrated system, constant in capital value, none would be produced. Things that were instantly perishable on production would be constantly in course of production in a continuous system.<sup>1</sup>

In this state of equilibrium the flows of money into spending and saving, of saving into hoarding and investment, also would remain constant. That which was saved and invested would grow "in stature" as interest accumulated until it was ready for consumption when it would shrink in stature as it was used, suddenly in some cases, slowly in others. The values of capital goods, taken *in toto*, in such a state of things, have been likened by one writer to a population of pounds of varying size<sup>2</sup> because of the accrued interest attached to them during investment. Some writers refer to the scheme of capital prices as the capital value structure. Those who approach the study of economics by making a first assumption of a perfectly equilibrated system, modified later by imperfections, are at the present moment investigating the significance of this structure. It serves our purpose if we simply indicate the conception which they are employing.

We have already dealt with man's attitude to the future and we have shown that over the whole of his future pattern of living there hangs the pall of uncertainty beyond the limits of life, modified to a certain extent through interest in future generations. One writer<sup>3</sup> has suggested that the basic condition that determines the rate of interest is the expectation of living of those who buy for the future. Since this is somewhere between twenty and forty or

<sup>1</sup> All the features of the time structure of value would be present. Jevons and Bohm-Bawerk and Wicksell, in showing the "productivity" of capital, show the accumulation of interest due to the discount process.

It should be noted that Bohm-Bawerk, Jevons, and Wicksell make an assumption that the quantity of produce increases as time passes. A unit of work is performed 20 days from its final use and this is 20 day-days of work at the end of 20 days. We cannot treat these investment-time units as product. Bohm-Bawerk speaks of "wisely-chosen roundabout methods". All three—and Professor Hayek seems to make the same leap in his *Prices and Production*—assume an increase of quantity.

A further difficulty in Wicksell's theory of interest is the difference between the marginal productivity of saved-up labour and saved-up land and the marginal productivity of current labour and current land, respectively, is to explain why the saved units of each of the factors should be equally effective.

<sup>2</sup> Boulding, K. E., "The Application of the Pure Theory of Population to the Theory of Capital," *Quart Journ of Econ*, 1934.

<sup>3</sup> Cassel, G., *The Nature and Necessity of Interest*, ch. 1v.

fifty years the rate of capitalization is twenty to fifty year's purchase, representing 5 to 2 per cent. But in addition to this expectation there is the uncertainty due to ignorance of what might happen. Whatever the cause, the discounting rate is there and it imposes features on the price system.

The feature of theoretical interest in the administrative scheme, which is a result of this discounting process, is the apparent modification of the equi-marginal principle in men's allocations of their resources. A person, laying out his money, partly on the acquisition of present or immediate satisfactions and partly on the acquisition of future satisfactions, does not allocate them in such a way that these marginal satisfactions (or marginal monetary returns), in all directions are equal. He allocates them so that the marginal investment will bring in a return in the future which is equal to the return on the marginal investment in the present (spending) *plus* an amount which we call interest. If a person pays wages to a worker he takes account of the value of the worker's product. In making his offer, however, he allows for interest. If he hires a unit of land he considers the value of the product of the land but he discounts the value if it is a future product.

This modification of marginalism does not affect the validity of the theory. All that it amounts to is a more exact statement of it. When returns are balanced against costs by an administrator of resources he states his ratio as discounted returns to discounted costs. Then he allocates his resources so that present marginal returns values are equal. If his costs are present costs there is no discounting of them; if both are equally in the future he discounts both equally and if his returns are present and costs are future he "pays interest."

Variations in methods of production may take place, changes in prices may take place as a result of the production of different quantities of goods and services, but interest remains as the agio between future and present values dependent on that which causes men to discount the future.

There is one more conception which it is important for students of economics to appreciate and one which it is most convenient to discuss at this juncture. It is a conception which will serve to gather up in the mind all we have said previously in this chapter and it will illuminate all that follows. It is, further, a conception which is revolutionizing the approach to economic studies. We refer to the conception of a price scheme as the expression of a general equilibrating of the distribution of property.

For several generations economists explained the phenomenon of price determination by considering the price of a single commodity.

They either entered into the discussion of the elements of "cost" which were accumulated into the exchange value of the commodity (the method of the Classical school), or they discussed the inter-sections of supply and demand curves of varying shapes, showing variations in "costs" and "utilities" respectively (the method of the neo-Classical schools). Both groups, it will be observed, took out of the system, so to speak, one price, isolated it from all other prices by calling upon their readers to assume "other things being equal" and proceeded to build up from this price a series of connections with others into a conception of a system of prices.

Everyone who has read any elementary book on economics is familiar with these "supply and demand" curves. Their use in the early stages of economic study is still very general in spite of the fact that they call upon beginners to make a tremendous abstraction from reality. Frequently, for instance, these beginners are called upon to assume a condition of perfect competition as a starting point, a conception which can only be formed at a stage which is fairly advanced.

When the Classical theories of value (the "labour" and "cost of production" theories) were overthrown by the Psychological economists' introduction of utility as the determinant of value the way was opened for a new approach. The Classical conception of "real costs" as efforts yielded to the new conception of satisfactions foregone and this at once made it plain that, in reality, every price is intimately related to other prices in the system, and the high degree of abstraction involved in isolating a particular price became apparent. From that time forward the tendency in economic theoretical work has been to consider the conditions of general equilibrium of the pricing system instead of the particular equilibrium at some point. If the conception of a general equilibrium is grasped the conception of the condition of particular equilibrium is added unto it, but the conception of particular equilibrium does not so easily add unto itself the conception of general equilibrium. The qualification, "other things being equal" cannot, in fact, be understood without an understanding first of general equilibrium.

Nothing can be more obvious to the beginner in economics than the fact that the significance of any particular resource depends upon the pattern of resources a person possesses. And, again, nothing can be more obvious than the corollary of this, namely, that if a person contemplates changing his possessions by the purchase of some and the sale of others, what he buys or what he sells does not depend upon a single price but, or rather, upon the whole scheme of prices at which he can buy, sell, or in other words, upon the whole scheme of possible "exchange substitutions" which exist. As he



proceeds to make his substitutions the scheme of possible substitution ratios changes and he never makes a move without there taking place a change in the general pattern of possibilities. The equilibrium he always "watches" is, then, a general equilibrium and the equilibrium he establishes is a general equilibrium. It cannot be otherwise.

Buying and selling in the market—the so-called "higgling" of the market—is then a process of adjusting a whole scheme of substitutions and equilibrium is established when all desired marginal substitution ratios are equal to all marginal possible substitution ratios. When a market is in equilibrium *all prices* in all markets are in equilibrium.

If we bear in mind that prices in the open market are substitution ratios it is clear that some people will wish to make their substitutions by parting with certain resources which others wish to acquire. Market prices then are inducements to "supply" and "demand" of all commodities and, in equilibrium, all commodities are possessed in such quantities that there is no exchange price quoted which will induce any change. It is sometimes said that prices equate supply and demand. But, in actual fact, prices determine not only what people will supply, but, also what quantities they will retain. Prices, then, determine the complete allocation of all resources, those bought and sold and those retained.<sup>1</sup>

It will now be clear that the proper time to study particular equilibrium is after the condition of general equilibrium has been considered and, really, the Classical and neo-Classical approach is one in which the "cart is placed before the horse". Abstractions can be made *ad libitum* when their significance is understood, but not before.

From what has been said in previous chapters it will be apparent to the reader that the "forces" or determining conditions of a price scheme lie ultimately in (a) the actual distribution of resources precedent to the price scheme under consideration, (b) technical possibilities of attaining physical juxtapositions of resources on the part of those who own them and (c) the psychological make-up of the property owners or exchanging parties. The fact that changes in physical results can be related to physical causes and, under certain circumstances—in the manner discussed in Section III, Chapter II of this book—these relations can be expressed as equations and the further fact that the attractiveness of a given resource can be similarly related to the quantity of the resource possessed (see Section III, Chapter IV), have given rise to the conception that the

<sup>1</sup> Wicksteed, P. H., *Common Sense of Political Economy*, vol. II, chap. II, pp. 229–234.

whole pricing system can be regarded as the solution of a complicated scheme of equations<sup>1</sup> The equational conception—of supplies and demands, under certain physical and psychological conditions, equating at certain prices (the solutions of the equation)—is a conception of great value But it is a conception which can only be of “conceptual value” It is a necessary part of an economist’s intellectual equipment but it must not be thought that the equation is one which can be “worked out” in actual life.

Recently there has developed a discussion of the possibilities of establishing a free-pricing system within a socialistic community and some writers are investigating the possibilities along the line of solving the equation we have referred to<sup>2</sup> To the present writer these investigations seem doomed to failure, for, apart from the enormous mathematical difficulties that such a complicated equation presents it must be observed that the pattern of substitutions that people are willing to make depends in the first instance upon the distribution of property—or freedom—which exists initially, and the attainment of justice (the objective of these writers) depends upon this initial distribution.

<sup>1</sup> Walras, Pareto, Cassel

<sup>2</sup> Dickinson, H D, “Price Formation in a Socialist Community,” *Econ Journ*, 1933

### CHAPTER III

#### THE DETERMINATION OF INCOME

When an exchange is effected between two parties, each gives up something and receives something or, in other words, each confers on the other a freedom to do something (or enjoy something) That which is paid out is outgo and that which is received is income. Thus, if a person sells a pair of boots, a day's labour, the use of an acre of land for money, the money is income and that which goes out is outgo We have already discussed the determination of the ratio between two things exchanged in the last chapter It is clear then that the study of the determination of income is, at least in part, covered by that discussion The determination of price is the determination of both income and outgo in particular transactions

The income of a person (or other unit) is not, however, regarded merely as the income derived from a single transaction. it is the total income derived from all the transactions during a unit period of time Thus, a person may sell labour and land and clothes simultaneously and his income is the sum of all that he receives from all the transactions together But this does not necessitate the extension of the study beyond that of price. From what we have said with regard to man's tendency to establish a general equilibrium throughout his pattern of living it is obvious that the incomes he derives from the separate sources are related to one another, the amount of money, for instance, which he acquires through the sale of labour will be related to the amount of money he can obtain from the sale of his other property. But the relationship of prices in this way is part of the theory of price

The principle of substitution which, in the last chapter we have seen to be the principle which controls relative prices, determining both equalities and the limits of inequalities, is also the principle that determines equalities and inequalities of incomes from units of goods sold or quantities of labour sold The costs of substitution set the limits to differences that can exist. Thus, if two pieces of land are available for use by a person for a period of one year and the prices demanded are 30s. and 20s respectively, this person will choose the one which gives him the greater advantage: it may be the higher or the lower. He will decide in favour of the higher

if the costs of substitution are greater than 10s. If the costs are exactly 10s. then the two prices are in equilibrium. The same principle applies to labour, machines, or any other commodity, whether it is sold outright or hired for a time.

The value of a patent right or the value of a name, to be used for all time, a period of time, in all places or in prescribed areas, is determined in the same way as any other commodity's price or any other freedom. The income from these rights is, then, explained by the theory of price already given. The maximum that can be obtained for a given freedom is the amount just short of that which a prospective buyer would prefer to use elsewhere and the minimum that will be accepted is the amount just over that which is the value of the next best alternative use of the right or freedom. The determinateness of the amount depends on the grading amongst buyers and sellers of substitutes. If things sold in return for income are capable of perfect substitution by others in the market then they can only bring in the same income as their perfect substitutes.

Examples to confirm the correctness of this pricing principle are very numerous in the market. The uniformity of prices which bricklayers obtain for their services, the similarity of rates amongst workers in different occupations who can easily transfer from one occupation to another, the similarity of rents of lands of similar quality for similar purposes, of lands that are equidistant from markets to which they sell similar produce, the inability of a person to make any income from the sale of his name when it adds nothing to anybody's advantage, any other name being as good, these are all cases which show the significance of substitutability.

The identity of the theories of price and income determination is sufficient to explain the existence of no-rent land, no-wage labour, no-value name, no-rent buildings, no-value businesses, etc. It shows that income is determined by productivity or utility just as price is and the value-less units of goods (or freedom of any kind) owe their value-lessness to the fact that nobody considers it worth while to substitute a payment for any of them for a payment for something else which he might acquire.

The conception of income which we have hitherto employed, as one of the terms of the ratio of exchange, is not the full conception which people have in mind when they use the term. When we speak of a person's income we think of a flow of money (or goods or satisfaction), or a certain amount per annum or other period. A person's income may—and usually does—vary from time to time, but it is clear that if we wish to investigate the conditions of a certain rate of income we can only do so at first by considering a system in such equilibrium that the rate is uniform. The question,

therefore, which rises to the mind is . What are the conditions that determine a certain rate of income per annum, continuously ? This question resolves itself into an inquiry concerning the conditions that lead to a continuous repetition of an exchange transaction so that the income term of the ratio of exchange can be repeated continuously through time

Now the repetition of a transaction continuously through time requires a repetition of the pattern of living of all who are in exchange relationships . a continuous reproduction of a pattern is a continuous repetition or a constant maintenance of the pulls and counterpulls in the community <sup>1</sup> This involves a continuance of the patterns of wants and their derived demands and it involves a continuance of the physical possibilities of pattern making . If resources are perishable, by nature or by use, it follows that a continuous pattern requires a continuous replacement and continuous replacement involves a continuous expenditure on the factors of production . Perishability in a continuous pattern requires constant expenditure . If the continuance of an income requires the continuance of an expenditure it is clear that there arises a possibility of a net income conception, the difference between income and expenditure over a period of time . It was this conception which Classical writers had in mind when, in their discussion of incomes, they argued that the causes of different incomes were different, that the rent of land, wages of labour, and interest on capital were not determined in the same way. Land, to these writers, was a gift of Nature, and rent was paid for the " original and indestructible qualities of the soil " <sup>2</sup> These qualities required no expenditure to maintain their continuous supply through time , hence the whole of the rent was a net income, the full income minus a zero expenditure . Machines wore out and, therefore, if they were to continue their service, they must be repaired and replaced , from the income drawn from the service of the machine it was necessary, therefore, to deduct the expenditure on wear and tear and replacement and the gross income did not equal the net income . The permanence of machine service required the laying aside perpetually of a certain quantity of resources and the net income was the return on this quantity of resources laid aside, saved, and invested. Rent to the Classical writers was an income that required no investment to maintain its flow . interest did require investment

Labour, like capital, perished in use ; it was necessary, therefore, to replace it by feeding and generally maintaining workers, if

<sup>1</sup> See Pigou, A . C . , *Econ of Stationary States*, for a discussion of various kinds of such states

<sup>2</sup> Ricardo, D

these workers were to continue to earn their incomes. As in the case of machine maintenance, capital was required for the maintenance of men. In fact, the Classical writers worked out a theory of capital as that which was set aside for the maintenance of workers, the maintenance of machines ultimately resolving itself into the maintenance of labour. Interest was, therefore, something in the nature of a reward to the capitalist for maintaining workers. Wages were the expenses of labour replacement.

Their analysis of this situation was not quite so acute as that of rent and interest. In the first place, capitalists "maintained" others besides labourers during the period of production and marketing of a commodity. Landlords—and even other capitalists—were usually paid, to some extent, in advance of the final marketing. In the second place, the responsibility for maintaining a labourer in health and fitness lay, in a system of free labour—as opposed to a system of slave labour—upon the labourer himself. To the extent that the labourer was paid *in arrear* for work done, he had to possess a capital himself that would carry him from one pay-day to the next and, in any case, the employers only paid *in advance* the discounted value of labourer's products, so that in all cases the labourer, in a continuous system, maintained himself. The wages which he received were the source from which he drew the cost of maintenance.

As we remarked above, the Classical writers were concerned to discover the conditions of a continuous repetition of an income scheme. When their analysis was worked out their scheme of incomes was extremely consistent and the relationships of wages, interest, and rents were very simple to behold.

The factors of production were three in number—land in its original form, labour in its simplest form, and capital, the product of land and labour. A perfectly continuous scheme of prices and incomes had to be such, therefore, that the supplies of land, capital, and labour uses were continuous. Land was a perpetual source of service, capital could be made so by replacement, and labour also needed to be replaced because it, like capital, wore out. A continuous scheme of prices implied, therefore, a continuous stream of income receipts by the owners of these three factors. These incomes were, however, gross incomes and from the gross incomes were deducted the expenses of maintenance. The net incomes were the difference between gross income and expense of maintenance.

To the prices paid for land, labour, capital—anything in fact—in a continuous scheme the following general formula could be applied:—

Gross income received in transaction = Expenditure on Replacement + Net Income.

In the case of land the replacement expenditure was nil, in the case of labour the net income was nil, in the case of capital neither expenditure nor net income was nil. If, therefore, we call the actual amount received for the use of land, labour, or capital the gross income, the positions in these three cases were as follows —

|   |         |              |                               |     |                   |        |
|---|---------|--------------|-------------------------------|-----|-------------------|--------|
| 1 | Land    | Gross Income | = Nil replacement expenditure | +   | <i>Rent</i>       |        |
| 2 | Capital | " "          | = <i>Capital</i>              | " " | + <i>Interest</i> |        |
| 3 | Labour  | " "          | = <i>Wages</i>                | " " | + Nil Net         | Income |

An examination of these three parallel equations will show that these "incomes" of rent, interest, and wages, are not incomes of the same type. Rent and interest are the second terms of the right-hand sides of their respective equations as "net incomes", wages is the first term on the right-hand side of its equation, as an "expenditure on maintenance". Thus rent and interest fall into a category of their own in contrast to labour. The question arises then, Is it correct to speak of wages as an income from the use of labour, analogous to the incomes of rent and interest from the uses of land and capital respectively?

The difficulty can be overcome when we examine the uses made of these net incomes. Rent may be spent by the landlord in any way he chooses. His land, being permanent, yields its stream of rent regardless of its mode of use. Interest, similarly, may be spent as the capitalist wishes, with no regard to the maintenance of capital. This maintenance is provided for, before interest is calculated. The worker also may use his wage as he likes taking no thought for the reproduction of the labour whereby he obtains his wage, but in this case there is a coincidence which does not exist in the other two cases. When the labourer spends his wage on "enjoyment for its own sake", he normally produces the labour for re-sale on the morrow. He eats his meals for the satisfaction of his appetite and the enjoyment derived therefrom, but in eating for this purpose, he incidentally refits himself for work. If, therefore, we regard wages as the *means of living* and not as *capital replacement* we have a conception which enables us to transfer "wages" from the first term of the right hand side of the equation to the second term, thus —

$$\text{Gross Income} = \text{Nil replacement expenditure} + \text{wages}$$

According to this analysis, wages are "net income", analogous to rent and interest. It is, in short, to be regarded as a *rent* of labour in precisely the same way as we regard the rent of land. The Classical economists held that rent of land was a surplus, a something for nothing, because it did not depend upon expenditure: in the same

way, wages must be treated as something for nothing. A worker receives for his labour the value of his labour regardless of the expense of maintaining it. For a worker to supply a continuous stream of labour so that he can maintain his wages it is clear, of course, that the "net income" or "rent" of himself must be at least equal to the necessary expenditure on maintenance. A worker may, of course, draw a wage in excess of his expense of maintenance and, in so far as he does, this excess is, like the rent of land, not a payment necessary to produce the labour though it is necessary that it shall be paid in order to induce the worker to render the service to an employer. A certain part of the excess may also be considered, in some cases, as interest on capital invested. If, for example, a particular skill requires that resources be utilized during the period of acquisition and, for the maintenance of the skill, a continuous expenditure is necessary, then in a continuous unchanging system the "extra" wages of the skilled worker constitute the interest on the value of these resources employed. So, with land, in certain cases the rent may be a "gross rent" from which expenses of maintenance are deducted (drainage, repairs of fences, etc.), leaving a net income or interest on this investment. In both cases, however, improvements in land and skills in labour constitute, according to this analysis, capital which can only be maintained in supply if interest is forthcoming.

Later writers, recognizing the similarity of wages of labour and rent of land and identifying capital as something made by the use of original resources of labour and land, saw that the elements in all incomes which had no corresponding expenditure for their maintenance were of the same order and used the concept of "rent" as a general concept, to be applied to incomes of this type from any factor. Thus they evolved the concepts of rent of ability as well as rent of fertility or situation. What they did not see was that if wages were to be regarded as net income earned by a person lending himself then the whole of the wages except that due to investment was also of this same order. The fact is, of course, that the wages of labour have a dual aspect; they may be regarded as *gross income* from which expenses of maintenance must be deducted leaving a net income as return on the resources turned over as food and labour or they may be regarded as *net incomes* whose expenditure by the worker "produces" *incidentally* the labour which can earn another net income in the next unit period of time. The latter aspect is the one which we must have in mind when we consider the forces that determine wages: the former is the one we must bear in mind when we consider the conditions of continuity.

The absence of any necessary expense to maintain the flow of



rent—economic rent—gave rise in economic literature to a classification of incomes into *earned* and *unearned*. Earned income included wages and interest because in the former case labour had to be maintained at an expense and in the latter case interest could only be obtained by incurring the expense of investment. Land—in its original form—and other qualities of a natural and permanent type drew unearned incomes because no expense was necessary for their maintenance. The quality of being earned was possessed only by the incomes drawn through the sale of perishable resources which could be replaced, the incomes on permanent resources or qualities were rents.

The Classical writers who formulated the “unearned” conception of rent made the mistake of confusing expense with cost. It did not occur to them that in a world of free bargaining an income could not be insisted upon unless the recipient had some alternative use to which he could put the resource lent; that is, they included expense but not alternative income as cost. Modern writers, showing the conditions of equilibrium in a world of private property recognize no costless income since no income can be maintained unless the owner has to give up alternative use. Unearned income—the Classical *rent*—therefore, passes out of existence in a fully equilibrated exchange system and all incomes are determined, like all prices, by the balancing of advantages acquired and advantages given up.

There is value, however, in the old conception. After all, the rent of a piece of undeveloped land is an income to maintain which no *expense* is necessary and a person possessed of exceptional natural ability can enjoy a part of his income on account of this expenseless quality. The expenseless income in a continuous system is really a measure of a person's advantage in possessing a resource which is worth, per unit of time, more than is necessary to maintain its flow. It draws attention to the fact that, when a person draws more than he has to spend in maintaining his income, he enjoys a position of non-substitutability. “Rent” is thus the measure of the value of monopolism.

A perfectly continuous, equilibrated exchange system, then, provides incomes which

- (a) in all cases allow for the replacement of the resources by which incomes are drawn,
- (b) allow of interest on investments,
- (c) allow of “monopoly rents” where substitution is imperfect.

A further value of this conception of monopoly income or rent is that it gives us a fuller appreciation of the meaning of private enterprise. A person seeking to maximize his income or satisfaction

aims at the fullest value development of any special or unique quality of his resources. An *entrepreneur* is, at heart, a monopolist and aims at as large an expenseless income as possible. A person who operates in a perfectly competitive system wins no such income at all, but he aims at it. If he has unique ability he develops it by investing in it, if he possesses land he invests labour and capital in it, if he has the monopoly of a particular design of commodity or brand, the right to a trade mark or a privilege of any kind, he develops it by the use of other resources with it. Private enterprise is the development of private opportunities.

There has, doubtless, in recent years, been a too great readiness to jettison the Classical conception of economic rent, to reject the idea of a "surplus" income possibility. The Classical writers discovered expenseless income and, identifying expense with cost, claimed to have discovered costless income. Modern writers, discovering that cost is not identical with expense, have rejected the idea of costless income but, in rejecting it, have tended to reject the idea of *expenseless* income. They have, therefore, made the Classical error reversed. The cause of the difficulty lies in the pre-occupations of economists. Modern economists are preoccupied with the determination of price and, quite rightly, see income determination as price determination and *costs* are, therefore, of primary significance, the Classical writers saw price as something built up of incomes drawn by factor owners and, therefore, they concentrated on income as an expense of production.

Hitherto we have discussed the conditions of a perfectly continuous equilibrated system. Such a system involves the continuance of the pattern of living in all its details, the continuance of every worker of every type, of every business of every type and size. It is a highly abstracted and unreal system. Men are born, grow to maturity, and die, businesses also grow to maturity and die. Goods that are in demand at one period are useless at another. If, therefore, we are to speak of a continuous equilibrated system that has any relation to reality it is clear that it must be one which allows for the disappearance of resources and units and their replacement by others. This economists do by speaking of the continuous equilibrium of a market.

If there is to be a perfect equilibrium of this kind it is necessary that conditions shall be such that for every old person who retires or dies there shall be another to take his place; as younger men grow old their places must be taken by younger ones still. As businesses fade away others must replace them and, as old lands are forsaken, new ones must be brought in.

The Classical economic rent or "special advantage" conception

is useful in enabling us to perceive the nature of the changes in such an order of things. As men and businesses develop they must draw, or have prospect of drawing, a certain amount of rent, as they fade out, the position is reversed. A man, growing old, finds himself unable, out of his income, to maintain his efficiency and, therefore, his income. He is more and more easily replaced: he suffers an increasing disadvantage. Instead of his income yielding a rent, a surplus over expense of maintenance, he suffers a "negative rent", a deficiency below the expense. He receives his value but the value dwindles. He possesses a certain degree of uniqueness but it is a uniqueness of disadvantage, of lack of opportunity. A business finds, in course of time, that its "surplus" disappears: it becomes ossified through routine, habit, and fixed machinery providing old-fashioned goods. In time, like an old man, it disappears. Lands at times find, through the shift of population, their positions of advantage lost, rents fall, lower and lower; in time, to let them might require even the payment of a negative rent. At all times there are men whose value is less than their cost of maintenance, machines, and buildings whose value does not cause any reinvestment, lands whose rentals are negative.

## CHAPTER IV

### GENERAL SURVEY OF PRICE AND INCOME STRUCTURE

Having defined the concept of price as a ratio and having shown that incomes can be reduced to price statements it will be seen that the scheme of incomes and prices reflects all changes in an exchange economy. There is value in taking a general view of the scheme, considering the scheme of interrelationships amongst exchanging units as a whole, and emphasizing certain features which have not been emphasized in the more particular studies of price adjustments from which we have immediately come.

The essential unity of the scheme is perhaps made most clear in a monetary economy when we realize that every price is a ratio of a quantity of money to a quantity of money or other real or pseudo resources. If money enters as one term in every price ratio it follows that every price ratio is convertible into a price of money. Thus if bread is 6*d.* a loaf, the price of 6*d.* is a loaf; if coal is 20*s.* a ton, the price of 20*s.* is a ton. This "price" of money is usually referred to as its purchasing power but it is important to bear in mind that the purchasing power of money is its price, that is, it is important to become familiar with the more unusual mode of expression.<sup>1</sup> This familiarity makes easy the appreciation of the fact that in an ordinary monetary exchange system everybody is engaged in buying and selling money, in "manufacturing" or "making" money. Money is the most universally acceptable of all commodities and it shows a tendency to be sold in the dearest market and bought in the cheapest over a wider area than all other commodities or services because it is the most mobile of resources.

The whole exchange system can, therefore, be regarded as a *money market*. This term is, of course, usually employed to denote the market in which loans are negotiated or foreign currencies exchanged; these are particular types of money market. The sense in which the term is here employed is the most general of all and converts the whole exchange system into *one market*. When we speak of prices in the wheat market we mean wheat prices in terms of money: wheat is a particular commodity and all wheat

<sup>1</sup> Cannan, E., *Money*, p. 3

prices are but a small fraction of the prices related in one system. If, however, we realize that when wheat changes in price, money changes in price in terms of this particular commodity we quickly realize that we are dealing with something of more or less universal significance. It is by employing this conception that we realize the infinite possibilities of a change in some particular corner of the system. It sets up a change in the whole scheme of attractivenesses and counterattractivenesses whose balancing is a matter of such great importance to economists.

It is a sound instinct that is leading modern economists to write of a price structure rather than a price level. At any given moment there is no such thing as a price level, there can only be a scheme of price relationships. Even as there is no such thing as a contour level that can be given a "height" unless some arbitrarily chosen datum line has been adopted, so there can be no such thing as a price level unless some datum has been chosen arbitrarily and even when this has been chosen we cannot decide to what extent one level is "higher" or "lower" than another without making questionable assumptions. With a geographical configuration it is possible to imagine (and calculate) the average height above a certain point of all points in that configuration as an irregular solid can be reduced to a regular solid, but in price configuration this is impossible. Every price is unique in one of its elements: being a ratio it expresses simply a relationship between two quantities of which one is money but the other is one of a million others. The price of coal cannot be compared with the price of milk except in significance to a single buyer or seller of both commodities. Groups of specified commodities may be taken (as in the "cost of living" index numbers) and "weights" may be employed (as in the calculation of most price index numbers) but they are either "partial" measures or indicators of partial significance in all cases. None of them has general, precise significance.

There is one case in which the whole scheme of prices is changed in a uniform ratio and that is found in the realm of international trade. Each country has its own currency and all prices are stated in terms of that currency, but each currency has a price in terms of other currencies and this price changes in the foreign exchange market.

If the pound sterling rises in dollar prices from \$4 to \$5 it is clear that all prices in this country measured in dollars increase by 25 per cent and all sterling prices in America fall by 20 per cent. This is obviously true because in every price ratio in the market the money term is changed in uniform proportion. This exceptional

case has no significance in our immediate study of a closed economy

We do not, of course, deny the value of index-numbers showing the variations of price level. They indicate, when properly constructed, changes of which our experience makes us aware, and they have definite value in certain theoretical expositions of phenomena associated with the movement of money from one area to another, inflation and deflation, "general increase in productivity" (a quantity equally difficult to measure), the output of gold when this is used as a basis of currencies, etc. We wish to emphasize that changes in prices are best conceived as changes in price structure and that all changes are indeed changes in price structure even when there is a "general" rise or fall in the prices constituting this structure. The conception of structure rather than the level of prices gives significance to the interrelationships of prices which we here intend to note.

In the first place, it is of fundamental importance to observe the difference between *capital prices* and *service prices* or, as we have elsewhere named them, in the language of the layman, "purchase prices" and "hire prices". Hire prices, are, of course, purchase prices, but these common terms emphasize the distinction between the right to enjoy "a unit of service" measured in time and a "*stream* of such units through time". The importance of the distinction between capital prices and service prices lies precisely in this, that the effects of changes in "time valuation" show themselves in changes in the ratio of service and capital prices. The purchase price of a house is that which must be paid to acquire the whole use of it in the future. The rent of a house is that which must be paid for the use of the house during a unit of time. A change in "time valuation" will affect the ratio of rent to purchase price.

The consideration of the time factor in the price structure is, as we have already seen, the consideration of interest and the peculiar feature of the price structure with which we are here concerned is that which is due to this "bond of relationship" called the interest rate. We are concerned with the changes in the price structure and the consequential changes in purchase and investment possibilities due to changes in interest.

Changes in the rate of interest are brought about by changes in the volume of money available for investment through saving and making provision for 'liquid' resources as hoards, changes in expected productivity of investments and changes in the degree of certainty or uncertainty attaching to investments. Any of these changes in economic data lead to general readjustments

of ratios between capital prices and service prices and, consequently, to a general change in the valuation structure

If we employ the conception of all values—of the values of all resources—as individuals in a population whose magnitudes are pounds invested at compound interest accrued<sup>1</sup> or pounds discounted for varying lengths of time, it is clear that a change in the rate of interest changes these magnitudes differentially and, consequently, all purchasing powers of individuals and units in the community are affected differentially.

A change in methods or conditions of production which changes the expectation of profits similarly affects the rate at which investment is made. A new venture, expected to yield profits larger than the current rate, will tend to raise interest and a fall in profits will tend to reduce the demand for capital with a consequent fall in interest rate. In the course of “progress” both kinds of change take place: there is a continuous, increasing demand for new capital for new ventures and a continuous “release” of demand for replacement of old capital. The rate of interest varies according as some demands rise at a greater or less rate than the others fall

A change in certainty of the future affects the volume of investment, extending the amount offered in case of increased certainty and reducing the amount offered when uncertainty increases

None of these changes, as a rule, affects the economic system as a whole, immediately; they take place in some *part* of the system and the other changes are of the nature of reactions, responses, or adjustments and they do not take place uniformly.<sup>2</sup> A fall in the rate of interest due to increased savings, for example, tends to drive up the capital values of “fixed interest” rights and tends to drive up the capital values of resources whose volume cannot immediately be increased. On the other hand, the greater capital values of these resources induce the investment of new resources in these forms, and the expansion of capital values proves to be in part at least temporary. A new opening for investment tends to raise the rate of interest. This in turn reduces the capital value of “fixed interest” rights and reduces the values of resources whose volumes cannot be quickly reduced. Very durable resources suffer heavily and perishable resources less heavily.

Changes in the degree of certainty attaching to future service payments cause, perhaps, a general increase or reduction of

<sup>1</sup> This is only true in a stationary economy, of course

<sup>2</sup> Uncertainty due to political changes or political uncertainties, e.g., fear of war or revolution—affects interest rates and capital values throughout the system and may be violent.

hoarding according as the change is in the direction of less or more certainty in general. New differences are revealed and the variation in capital values is always great. A general reduction of certainty, however, retards investment in long date investments, though the degree of retardation varies according to the investments. The State may, in such changing circumstances, stand out as a rock in a rough sea and its "stock" may rule at relatively higher rates than industrial or commercial investments. On the other hand, it may be the State whose "security" is most questionable, in which case industrial and commercial investments have the advantage.

The post-War period of intense uncertainty has seen a very considerable drift of money away from investment into hoarding and a very considerable drift from long date investments: short term loans have been most sought after as being the most secure.<sup>1</sup> Where expansion has taken place it has been due to the "excess" attractiveness of very large profits cancelling out the discounting effects of the uncertainty. There is no doubt that uncertainty has been one of the greatest factors operative in this period and its reaction on the "basic industries"—the long date investments—has been the inevitable result.

The second relationship that we must note amongst prices is that which we may call the *factor-product* relationship or, as it is perhaps more familiarly known, the cost of production and selling price relationship. In an equilibrated system the value of a product is equal to the values of the factors involved in its production, added together. This relationship is obviously one that can be run back through all the factors contributing to the production of factors or forward to the products of which the product being considered is a factor. To use the terminology of the Austrian school we may consider the relationship as that between goods of successive orders, first, second, third, etc., from "final" goods to "original factors".

As we pointed out in an earlier chapter this relationship is not a simple straight line relationship from higher orders to lower orders, but a "behind before" relationship of things in a circle. Thus, we may say that the cost of bread includes the cost of the factors composing the bread, but the cost of maintaining the factors in the system includes the cost of bread: in other words, the force of attractiveness runs completely round. This is a relationship very frequently overlooked by the various groups involved in economic disturbances: one group holds that the system cannot

<sup>1</sup> See Keynes, J. M., op. cit., on Liquidity, Efficiency of Capital, and the Rate of Interest.



continue unless, for instance, wages are "cut", others hold that it cannot continue if wages are "cut" because that will spell the destruction of homes. All such groups present parts of the truth, a circle may be broken at any point and the circulation through the circle stop. If homes are not maintained business stops, and if business stops homes are not maintained, though a circulating system can continue, if there is a replacement of units.

The factor-product relationship helps us to show the direction of impulses imparted to prices by a change in any given price, whether of a factor or product. Consideration of an example will show, however, that there is no *a priori* way of forecasting these reactions. Let us take, for example, the case of a rise of the price of clothing and consider first the impulses backwards towards the factors.

In the first place we need to know the reaction on the market for clothing in order to discover if the new equilibrium between demand and supply involves (a) a smaller quantity of clothing being bought and (b) a smaller quantity of money being spent on clothing. This depends upon the elasticity of demand for clothing at the original point of equilibrium.

If we assume the same quantity of clothing to be bought the rise of price will show itself at once in an increase of profit. Profit is, however, the remuneration of one factor only so there will be immediately set up a pull on the part of the other factors for a share in this increased profit, workers will demand higher wages, machine builders higher prices, land and buildings owners higher rents, suppliers of raw materials higher prices and so on. The increased price of clothing is a measure of the increased valuation put upon the whole group of factors employed. The demand for clothing resolves itself into a joint demand for the use of the factors, land, labour, raw materials, equipment, and capital-disposal.

Economists usually deal with the relationship of joint demand as one of prime order in their classification of relationships, but by subsuming it under the more general classification of product-factor relationships we see it in its true perspective. Resources are usually regarded as being in joint demand when they are demanded in fixed proportions but this treatment makes this particular variety of joint demand the extreme case of fixed coefficients of production, the other cases being cases of varying proportions.

Immediately the fact is appreciated that all factors are in joint demand the consequential fact is appreciated that the change of price will have reactions on all the factors and that the different effects on the factor prices will be determined by the mutual substitutabilities of the factors or their relative elasticities of supply.

and their productivities. In the new equilibrium, wages, rents, and prices of raw materials are such that marginal expenditures in all directions are equal in their yields

We may now turn round and look from the factors to the products. A change in the price of a factor will cause a new pattern of production to be effected, a reorganization of the factors. This will cause a change in the quantity of product and a consequential change in price if equilibrium is to be maintained. But just as all demands for products are joint demands for factors, so all supplies of products are supplies of joint products. It is physically impossible to produce a commodity without producing some other results or products. The worthwhileness of producing any commodity will then depend upon the value of these other joint products taken in conjunction with the value of the "main product". What can be obtained for all the products—main and by-products—depends upon their flexibilities of price and their varying proportions of supply, and the new equilibrium will be established where the marginal revenue from all products taken jointly equals the marginal costs of production. The extreme cases are (a) those in which the values of all but one product are nil (single product cases) and (b) those in which more than one of the joint products have value and are produced in fixed proportions (the cases usually regarded by economists specially as "joint products").

If we consider the sale of a real resource as the purchase of money or the purchase of a real resource as the sale of money it will be seen that joint supply and joint demand establish price relationships in the market by the same principle. In the case of joint supply it is clear that prices must be such that to every unit producing in an equilibrated system the marginal revenue from the sale of one product equals the marginal revenue from the sale of another. In the cases of joint demand it is equally clear that the marginal expenditure on one factor must be equal in net productivity to the marginal expenditure on any other.

A rise in the price of one *factor* will, as a first effect, reduce the amount that the demanding person or group can afford to pay for the others, but, by substitution it may be possible to alter the proportions employed and so maintain or even change the price of the other in the same direction. A rise in the price of one joint product will make possible, in the first instance, the acceptance of a lower price for the other joint product(s) but, again, by a process of substitution relative quantities produced may be altered so that the other produce prices may fall, remain constant, or even increase also. The ways in which the prices of joint products or joint demands move in association depend upon their relative elasticities of supply, demand, and substitutability.

The introduction of the conception of substitution is the introduction of the conception of competition and economists have emphasized the importance of the competitive condition in the supplies of certain resources and in the demand for them. An iron smelter demands coal and iron ore jointly, he cannot substitute the one for the other since he needs both. He needs coal for the production of heat, but coal is not the only means which he can acquire for producing heat: it is conceivable that he might use electrical energy. Thus, there is possible a substitution of coal by electricity or of electricity by coal. Coal and electricity are competitive supplies; they represent, to him, alternatives. To the domestic purchaser, tea and coffee, beef and mutton, butter and margarine, are pairs of *alternative factors* in the production of his standard of living.

On the other hand, a person may supply a product to one or another of two or more markets. He may supply rubber, say, to firms who produce mackintoshes or to firms who produce motor tyres; these industries are *alternative markets* or markets capable of being substituted one for the other.

Alternative factors are termed *composite supplies*, alternative markets constitute *composite demands*, they are competitive supplies and competitive demands respectively. This relationship of competition has an important bearing on price relationships. If the price of one alternative factor rises, the demand for that factor will be transferred to the other; if the price offered by one market rises, the sales will be deflected thereto from the other market. The prices of composite supplies move in conjunction with one another and the prices in competitive markets also.

The relationship of "jointness" and "compositeness" can be most easily understood if we consider a single commodity or service and think of it in association with some other. White wheat flour is a joint supply with bran; they are inevitably produced together. It is in joint demand with yeast in breadmaking since both are essential factors. With rice flour it is in competition, so rice flour and wheat flour are composite supplies. As wheat flour may be used for bread, or say, sticking paste, these two uses constitute a composite demand for it.

These two relationships are particularly important to note by all who have an interest in particular price movements but it is important in economic theory to appreciate the fact that they are general relationships tying together the whole price system. As we have said before, it is impossible to produce one effect without producing another; consequently, no economic change can be regarded as a single change and in making any decision it is always

essential to observe all concomitant changes of supply and demand, in other directions as well as in the one of immediate concern. When an increase or decrease of supply or demand of one commodity brings about an increase (or decrease) of any other commodity's supply or demand, these two commodities are in joint supply or joint demand. When an increase in the supply of one service causes a decrease in another through change of demand, or an increased demand for a service leads to the decrease of demand in another direction, the position is one of composite supply or composite demand.

## CHAPTER V

### EQUILIBRIUM AND DISEQUILIBRIUM IN THE PRICE-INCOME STRUCTURE

That there is a tendency in the price-income structure towards an equilibrial state would seem to be obvious both from the evidence of our intuitive experience and from the evidence of external data. We are all conscious of a persistent desire to make the best of our circumstances, of a tendency to move from the lesser to the greater satisfaction, and we are all aware of our tendencies to adjust either ourselves to any change in external conditions or our external conditions to ourselves. In the price-income structure we are all equally aware of the fact that when a change in any part of it is made other changes follow as a consequence, changes we denote as reactions. When the price of a commodity rises there is usually a fall in the demand for that commodity and if demand changes so that a fall takes place in the price there is usually a fall in the supply. "Reactions" are a sign of interrelations and they are a sign of a necessary tendency to equilibrium or adjustment.

It has been said that this tendency towards equilibrium is a result of the condition of scarcity. Every change involves some person in using his property in a new way. It will be realized, however, that scarcity is merely a convenient term in economic discussion for a condition that holds in the whole universe of matter and energy. There is a tendency towards equilibrium in the physical universe but physicists do not attribute it to "scarcity", though they do assume that a thing cannot be in two places at the same time. A more general mode of expressing the position is to say that some relationships are incompatible with the maintenance of others and that the tendency towards equilibrium is a tendency towards the resolving of incompatibilities.<sup>1</sup>

In the administration of his resources an individual is in a condition of equilibrium when he cannot, by altering his allocation of expenditure in any two or more directions—that is, by substituting one or more expenditures for one or more other expenditures—improve his position (measured in terms of satisfaction or money

<sup>1</sup> See above, p. 7

income) The doctrine of equimarginal returns of satisfaction is simply the statement of a mathematical condition of compatibility of relationships between a person and his resources. It is incompatible with the desire for maximum satisfaction that a person should leave his allocation in such a condition that by transferring a unit of expenditure from one line to another he could increase it. Thus, in so far as man pursues maximum satisfactions, he tends towards equimarginal returns.

That there is one price for one type of service in a competitive market is a statement of a necessary condition of compatible relationships. If two hatters offer me the same kind of hat at different prices it is incompatible with my desire to maximize the use of my resources that I should pay the higher price. If two purchasers offer one hatter different prices for one hat it is incompatible with the hatter's tendency to maximize the use of his resources that he should accept the lower price. If many hatters are selling the same kind of hat to many buyers and the hatters can substitute one buyer for another and the buyers can substitute one hatter for another the only condition of compatibility of buyers' and sellers' relationships is that there shall be one price ruling throughout. In the case of perfect monopoly, compatibility of relationships does not involve necessarily the equality of price because there is no possible substitution of one seller by another; a uniform price *may* be established if it alone is compatible with the seller's maximum revenue.

Perfect equilibrium does not, then, imply any condition of competition, monopoly, competitive monopoly or monopolistic competition. The only condition of equilibrium is that the relationships in the market and the relationships between men and their environment are not incompatible with one another. Incompatibility is the cause of change which is described as a movement towards equilibrium, and the basic tendency of all relationships to become compatible is the tendency of men towards a position of maximum satisfaction.

Now it cannot be too heavily emphasized that, in an exchange economy, where the rights of property are given and, therefore, are not subject to any change beyond those which take place through exchange or bargaining, the maximum satisfaction that is attained by an individual when the organization is in equilibrium is not the maximum satisfaction that is *desired*; it is simply the maximum satisfaction that is *possible* in the circumstances. Some members of the community may be in acute unhappiness and others in extreme happiness and yet within the exchange system there may be equilibrium since all have attained the maximum satisfaction

possible in the circumstances. This is of supreme importance for it is the basic fact on which we shall work when we come, later, to consider the part played by social control

We have pointed out that incompatibility of relationships is a *cause* of changes which are described as tendencies towards equilibrium. When a man acts he acts in the direction of equilibrium or what he conceives to be equilibrium, but the relationships which he attempts to establish are necessarily the relationships which he *expects* to be able to establish. If the data on which he acts change it is unlikely that they will change in such a way as to leave him in an equilibrated position. This does not mean that he will find himself "worse off"—he may actually be better off—but it does mean that the change of data will put him in a position that necessitates his altering his scheme of administration in order to establish a new equilibrium, a new condition of the "best in the circumstances".

We may illustrate this point by reference to a business man operating to produce the maximum profit. The data on which he works are (a) technical and (b) commercial; that is, he organizes his business on his knowledge of the materials and persons which he employs and his knowledge or expectation of prices. The price scheme may, however, alter in such a way that he makes more profit than he expected and yet, though he makes a bigger profit than he anticipated, he does not make the maximum profit which he would have made had he known what the actual prices would be. His administration, therefore, does, in fact, move towards equilibrium but the change of data involves his moving into disequilibrium or a condition in which there are incompatible relationships, namely, a desire to make the maximum profit and an organization, which he controls, not making the maximum.

The data which change—willy-nilly so far as the individual administrator is concerned—are of three types, physical, psychological and market. They are all related as we have indicated in earlier chapters. Physical changes are changes in the quantity of population and its physical quality, changes in the quantity and position or form of physical resources (coal resources are worked out, land is cultivated, the sea encroaches, equipment is accumulated, wears out or decays), changes in relative distance of resources. Psychological changes are changes in understanding (knowledge), changes in taste and changes in the attitude towards the future, both in the matter of concern for the future and the uncertainty of the future.

The physical and psychological changes are reflected in the exchange system as changes in the price and income structure.

A new method of production introduced at any point in the system means a new pattern of physical resources, and this means, in turn, a new pattern of demand and a new pattern of supply with the consequent new scheme of prices. A new fashion or standard of taste has the same kind of effect since it means the introduction of a new scheme of demand, and a new scheme of supply in response<sup>1</sup>. These changes in price, at first "local", have their reactions through the whole system *in time*. If I discover a new method of production or develop a new taste I *at once*, simultaneously with the change in my knowledge or taste, set myself towards equilibrium, but I immediately also change my pattern of "pulls" on the resources of the system and thereby affect the price scheme about me. My change of methods or tastes creates a new situation to which others must adapt themselves. I do not disturb my own equilibrium—I disturb the equilibrium tendencies of the others. I may find my own equilibrium disturbed later but it will be through the reaction of other people to my disturbance of theirs. The disturbance I impart to the system I impart through my operation upon the price scheme. I create a situation in which other people find that the optimum administration of their resources involves a change in their schemes of supply and demand of and for services—that is, I set up a situation in which there are incompatibilities.

The speed at which incompatibilities can be removed depends upon the facility with which people can effect their changes of patterns and this varies very considerably. We may illustrate the position by reference to an actual case.

When the Great War broke out in 1914 there was a sudden and extensive change in the demand for war materials by the Government. This new need expressed itself in a willingness on the part of the Government to pay higher prices for these materials. Those who produced them resolved the incompatibility of their lower prices and their desire for a maximum profit by putting up their

<sup>1</sup> It should be noted that "progress" in the economic—and, indeed, in the social—system *implies* a revaluation of resources. Sometimes economists describe the initiation of a change as the seeing of a new profit by the making of a new combination of resource purchases at old prices and a sale of products at old prices. This is one way of describing it. New possibilities of profit mean however, new price-offer possibilities for factors and new price-demands for products. Progress inevitably involves changes in values, rises in some cases and falls in others; it inevitably means, therefore, disemployment of some resources before they may be absorbed in new ways. This dislocation or disequilibrating tendency of progress, being inevitable, it follows that those "money reformers" who think that by issuing new money they can ensure the sale of everything that is produced, do not realize that they are proposing to stop progress.



prices. The high profits on capital employed in the production of munitions established a fresh incompatibility, namely, that capital was being employed in less remunerative lines by those who again sought maximum profits. They, therefore, wished to divert their capital to the production of munitions. The process of conversion, however, took time, munition factories were not built in a day. The deflection of capital into munitions involved its deflection from other uses and this created a situation in which there was an incompatibility between prices ruling for other commodities, now rendered scarce, and the maximum profits of those who were still producing them. These other prices rose. Thus the increased demand for munitions set up a series of actions and reactions throughout the whole price and income structure. Large profits were made in some lines of business, attracting capital and labour, small profits were made in others, repelling capital and labour, but everywhere there was a tendency to move because everywhere there was a feeling that present administration was not the best that could be effected.

This fact that the adaptation of the system to a new situation involves time has given rise to a distinction by economists between short period equilibrium and long period equilibrium. In the case quoted the reaction of the munition manufacturers to the change in government demand was a higher price level that established a short period equilibrium—or tended to do so—but the subsequent reactions leading to new investments in munitions were long period tendencies towards equilibrium. The positions are sometimes stated as (a) the equilibrium that tends to be established assuming the productive equipment and personnel fixed, and (b) the equilibrium that tends to be established when these specific resources are not fixed<sup>1</sup>

It will be clear, however, that short period equilibrium is a pure abstraction and does not, in actual fact, exist in the economic organization. Equilibrium implies no incompatibility and, therefore, no tendency to move or change. Logically, it follows that if there is a long period equilibrium as well as a short period equilibrium there must be a tendency implicit in the short period equilibrium towards the long period equilibrium, that is, there must be *incompatibilities in the short period equilibrium* conditions, which is absurd. Short period equilibrium is the "equilibrium" that would be established if the initiating change were so small that the secondary reactions were negligible. It is a valuable conception when analysing the kinds of reactions that take place immediately after a change has been introduced and it gives a useful clue for

<sup>1</sup> Marshall, A., *Principles*, pp 369-380

following through the other reactions, but it would be wrong to consider it as a true equilibrium position

When short period equilibrium is discussed by economists it is always discussed on the assumption that there is an initial condition of equilibrium. Since equilibrium so assumed must be "long period" equilibrium it follows that economists first assume general equilibrium throughout the system and then consider the short period equilibrium that results from a slight change in the condition of this perfect equilibrium. This, however, emphasizes still further the abstract and "unreal" nature of the analysis, for the general equilibrium which it assumes is, in actual fact, *never* attained.

The data, on which the authorities controlling resources base their administrative decisions, are always changing, continuously changing; therefore, since it takes time for the actions and reactions resulting from any change in any part of the system to work themselves out it is clear that the system never really attains equilibrium. Men are always tending—in their minds they think so—towards equilibrium, but they never reach a condition in which they have not to make a decision. In the sense that they are always doing their best in making their decisions they may be said to be in an equilibrated state but they are never in a position of equilibrium, in the sense that they can lay down for a long time plans that come to fruition.

It follows from this discussion of the non-existence of equilibrium, that all theories of price fixing and income determination based upon the assumption of equilibrium can only be regarded as statements of what *tends* to happen. The marginal equality of returns in the administration of resources, whether the returns be measured in terms of satisfaction or income of money, is not a condition that holds in fact; the system merely includes tendencies towards marginal equality. The uniformity of price in a market is not necessarily a statement of actually realized fact—it is merely a statement of what tends to occur. The physical and psychological changes noted above, with their consequent changes in prices, create a continuous condition of disequilibrium and all theories of wages, interest, prices, etc., imply a condition of equilibrium.

These changes have been termed by some economists "exogenous" causes of disturbance. They have been termed exogenous because they take their rise outside the schemes of administration, they are "presentations" to man of new circumstances within which he must operate. They are of prime importance in the consideration of the troublesome fluctuations in prosperity suffered by the industrial system and their significance as causes of trouble is not difficult to show.

During the last generation there has been a considerable change in methods of agriculture, manufacture, transportation, organization, and tastes. This change or congeries of changes has been rapid and violent. Prices have changed violently and often. Men have laid down their schemes only to find that they cannot persist in carrying them out because the data on which they have reckoned have changed. The system has been "struck" at so many points that waves of actions and reactions have been imparted to it, creating prices that were wrong indicators of what should be done if men were to administer towards equilibrium. It has been urged by some writers that the cause of the extensive dislocation of prices and costs has been the lack of plasticity in the system, the lack of men's adaptation of wage rates to the new position, adaptation of interest rates to new conditions and so on, but a certain amount of rigidity cannot at the moment be reduced if men are to make any attempt at all at administration and it is possible that the violence of changes in basic data can be such as to make even considerable adaptability non-effective. Some writers have urged this and, consequently, have argued that the rates of invention and technical change should be reduced, they have condemned what they regard as an excessive readiness to change fashions and modes of living.

Added to these changes have been variations in the feeling of security that "rumours of war" have produced, casting over the whole world in varying intensity a shadow that darkens the future making investment in the future a gamble on the one hand and the enjoyment of the present the only "sure" thing on the other. Nations have reacted by "protecting" themselves, and their measures of protection have been regarded by others as measures of disturbance against which they, in turn, must defend themselves. Thus there has developed a process of attack and counterattack which produces an even greater amount of incompatibility of ends. It does not seem a travesty of fact to say that over a period of years international relations have been conducted on policies dictated by instincts rather than considerations of possibilities, that the irrational elements in the situation have been extended, making settlement towards an equilibrium impossible. Even in internal affairs, over a large part of the world, gusts of passion have blown about fitfully, creating a sense of insecurity concerning the rights

<sup>1</sup> An increase in the rate of invention involves an increase in the rate of disemployment. For the rate of re-employment to be equal to the rate of disemployment, transferability must increase also. To some extent labour is made more mobile with the extension of the use of machinery, but there is geographical transferability to consider also.

of property men can expect to enjoy and, consequently, a feeling of despair regarding the turns of prices that might take place

This conception of the tendencies towards equilibrium in the exchange system, and the causes of disturbance of these tendencies, was the conception on which economists of the nineteenth century almost exclusively worked. It was the traditional conception and was one of the main bases of all their conclusions concerning the policies a nation should pursue. The sanctity of property, the sanctity of contract, freedom to bargain, free trade, non-interference by the State in any form but "police measures"—these were the conditions that paved the way for the grand trend towards the final equilibrium of a "static society".<sup>1</sup> Inventions—progress in general—caused a certain amount of dislocation, fevers of speculation caused financial crises, but these dislocations and crises were merely "growing pains" and "measles", things that were inevitable until we had attained a condition of complete versatility, perfect mobility of resources, wide knowledge and perfect rationality in our conduct.

The twentieth century has seen the growth of a new inquiry, an inquiry into this very basic assumption which was hardly examined in the nineteenth century, and to-day it has definitely been hurled down from its position of axiomatic majesty and unquestioned obviousness. Everywhere in economic circles the question is being asked, Does the exchange system tend towards equilibrium in face of exogenous forces only or is there something in the nature and structure of the system itself that tends to throw it into disequilibrium?

To answer this question it is necessary to revert to what we have stated to be the condition of equilibrium. The characteristic feature of a tendency towards equilibrium is that one change *involves* another change and, therefore, one attraction is immediately opposed by a counterattraction. If there is, in the economic system, some dissolution of this relationship, making possible two decisions that are incompatible with each other, yielding to one attraction without the gathering opposition of another attraction, then the essential condition of equilibration disappears. The questions asked above then resolve themselves into the query whether such a lack of "double-change" necessity is to be found anywhere. Is there anywhere in the system a condition of "suspended scarcity", of apparent but unreal compatibility?

The answer to this question would seem to be in the affirmative in the light of what we have written before concerning money. The secret of part of the instability of the economic system lies in the

<sup>1</sup> Mill, J. S., *Principles of Political Economy*, pp. 452-455, bk. iv, ch. vi.

fact that money is a pseudo-commodity. It was not, in the early days of economic science regarded as a cause of disequilibrium because the methodology of the earlier economists excluded the possibility of its discovery. It was for long their practice to discuss the "principles" of economics as the "principles" of a natural or non-monetary economy and then to introduce money as a simple medium of exchange of no real, fundamental importance except as determining what they called the "price level".

In recent years the economic system to be examined by the economists has been more and more regarded as a monetary economy. Actual experience of monetary experiments and manipulations has also emphasized the fact that there are other price changes of great significance besides general rises and falls of the "price level". More concern has been evinced about the price structure or scheme of relative prices.

It will be recalled that, when we described money as a pseudo-resource, the reasons we adduced were two; first, money—simple monetary units—is not of any direct "use" except as a means of exchange; secondly, that because, as a medium of exchange, it can be converted to anything with a price quoted in the market, it is, to an individual, virtually *any* commodity. The Classical writers failed to appreciate this second point.

Since the equilibrium of an exchange economy is an equilibrium of exchange relationships between individuals, it is clear that the point of view which will determine whether the equilibrium of the system is pursued is the point of view of the individual. To the individual in a market, money is treated as a real resource when he makes his allocation of his possessions.

In a natural economy a man can only exchange services against services; in a monetary economy he can exchange services against money—he buys and sells. In a natural economy a man cannot save unless he hoards some real resources or embodies his resources in some fixed form; in a money economy he can hoard money, that is, he can save—forego some particular form of satisfaction and carry forward purchasing power—without investing in any real resource.

This separation of the "natural" "double" process into two "single" processes establishing the possibility of hoarding money makes possible an individual administration of means that is unlike the administration by a member of a non-monetary economy, in that a sale by a person of some real resource *does not necessarily involve his purchase of a real resource* and his saving *does not necessarily involve his investment in a real resource*. The resources administered by individuals exceed in quantity the real resources

on which living really depends by the amount of money there is in existence at any given moment

There are two ways of dealing with this matter. In the first place we may think of all the purchasing power units—or money units—as distributed at any given moment among all the economic or social units in the system. This includes all the money which individuals possess in their pockets, tills or other “savings boxes” *plus* the amount of money held by the banks. The money held by banks is, practically speaking, the money deposited at banks by customers, but it is well known that of this money deposited at banks much has been previously loaned or advanced to clients. Owing to the practice of using cheques, money deposited is able to do its work through the mere transference of its ownership, in books or accounts. The deposits are then, to a great extent, available for loan and the banking system can lend money—which is normally the loan of the right to draw cheques—to such an amount as is consistent with its being able to meet the demand for legal tender or cash over the counter. Thus, if one million legal tender notes have been deposited with banks the cheque-using habits of the community may allow of banks really dealing with as much as eight or ten million pounds. The amount of money “held” by banks, therefore, must be regarded as the maximum quantity of deposits which they can, consistently with their meeting cash demands, allow to accumulate in their coffers *and books*.

“The position is not altered by the fact that banks only lend—with a relatively small exceptional amount—on security—the deposit of securities in return for an advance is merely another way of putting the position, the securities, if one prefers to express it in this way, are “sold” for money, but the money employed is increased by bank loans in any case. The amount of money in existence at any moment is, then, the total amount of legal tender cash held by all units in the system *plus* the amount of credit which the banks can possibly lend—cash *plus* bank money.<sup>1</sup>

The second way of dealing with money is to consider it, not as a stock of monetary units at any given moment, but as a flow through the various economic units. This will reveal (what we explained before) that some money flows on and some is, so to speak, kept in the million and one reservoirs of public and business holdings—cash in hand or till, or, at the bank, in books. The money may, then, as

<sup>1</sup> Note the difference between this conception of bank money and that which is ordinarily employed (by Professor Hayek and Mr Keynes and others). The general conception is that money consists of that which exists either in cash or in books of account—deposits. This, however, seems to us inadequate. The reserve “power” of lending is not non-existent, the credit which banks *can* advance they “possess”.

a stream of demand, be regarded as divided into two parts—that which is active and that which is “dead”, for the time being at least. That which is “dead” is hoarded; that which flows on is invested or spent. When people save cash they hoard it or invest it. If they hoard it they usually, in modern communities, deposit it with the banks. The cheque-using habit referred to above enables banks to *economize the use of cash in the work of hoarding* for their clients and the cash they so economize they can lend. This cash, when lent, is usually deposited and so there is created an increase of “hoardings” of clients which again the banks can hoard with economy, allowing of still further loans, hoards, loans, hoards, in dwindling size until the whole of the cash originally lent is the basis or eight or ten times the amount, in credit.<sup>1</sup> If we regard bank practice in this way the banks are absolved from the “charge of creating money”—they become institutions for increasing the “efficiency” of money. To the extent, then, that banks lend on credit, consistently with their maintaining their power to give to their clients at any time the “hoards” deposited, they are increasing the efficiency of the use of money.

At a given moment the amount of money “created” by the banks or, if the latter explanation be preferred, the “efficiency” of the use of money, may be less than is possible. In the former case and in the latter they may be regarded as holding hoards of money themselves. They hold purchasing power in their hands or they use it with less than the maximum “efficiency” and have, therefore, a quantity of purchasing power which they can release at any moment. Whether it has been saved or not by clients does not signify at all, there is a quantity of purchasing power in the form of credit which may be used at once to create a greater amount of investment or spending. Unused bank money and private hoardings of cash are alike, then, in this, that they are simply reserves of purchasing power: and they are alike in this, also, that they are an element of instability in the system.

Hoardings—unspent margins, uninvested funds, unlent bank money—are a centre of instability because they make apparently possible what is really impossible in a system which is fully equilibrated. In a natural economy we saw above that an increase of saving means *ipso facto* a reduction of spending or immediate consumption. But the existence of hoards of money makes these “natural” connections apparently unnecessary. Investment and spending can increase at the same time by the reduction of hoardings. they can diminish at the same time with an increase of hoardings. Investment can proceed with no curtailment of

<sup>1</sup> Hayek, F. A., *Monetary Theory and the Trade Cycle*, pp. 157–161.

of spending and spending can proceed with no curtailment of investment. Money can be withdrawn from spending and real investment and, instead of being piled up as hoardings, it can be spent in the purchase of rights to draw money, namely, securities: the money for such trading can also be withdrawn from the hoardings without being withdrawn from new investments or spending.

Even if the volume of hoardings remained unchanged and the money actively flowing remained unchanged there is a condition of instability in that there is possible at any moment—due, say, to a political scare—a large deflection of money from its usual direction of investment flow to spending or vice versa, with the consequential disorganization of prices and, therefore, of business schemes. But when, in addition, there is this reservoir of unspent purchasing power, the instability is enhanced. The development of a boom with its crisis makes manifest this instability.

In the early stages of advance, credit is extended with no change in the rates of interest charged and investments are made on the assumption of a continuing low interest charge. When the “hoardings” or credit capacity of the banks are beginning to approach their end the rate of interest is raised and undertakings based on the expectation of this low rate find themselves in difficulties and have to stop operations. The releasing of credit for a considerable period with no change of interest is, in effect, a suspension of scarcity, but when the credit “gives out” the conditions of scarcity assert themselves with some degree of suddenness<sup>1</sup>. Banks react by making the scarcity even more intense than is necessary, perhaps, so that they not only cease to expand but they also contract their supply of credit. If material resources were as easily converted from one form to another as money is diverted from one allocation to another then there would be no disequilibrium, but as goods and labour become specialized they lose their convertibility and are merely left in great measure derelict.

The shrinkage in credit effected by the banks when a crisis occurs at the end of a boom is, in part, due to the loss of value of collateral in their hands which their practice requires as “cover” for loans. This loss in value of securities indicates, in fact, another way of illustrating the statement that the monetary exchange economy does not operate within conditions that make perfect

<sup>1</sup> Professor Hayek calls this “elasticity of volume of money”. It would seem to be more appropriate to describe it as one of inflexibility of interest rate—or insensitiveness of interest rate. Wicksell speaks of the difference between market and natural rates and Mr. Keynes borrows the terms to show that investment and savings are thrown out of gear with each other.



equilibrium possible. The valuation of securities is a capital valuation and it is effected by capitalizing the expected income at the current rate of interest. Anything which causes a change in the rate of interest transmits at once a change in capital values throughout the system in relation to service prices. This change in capital and service prices relatively to each other has two effects immediately, in the first place, it alters the total money value of the community's possessions and, in the second place, alters the distribution thereof amongst the individual units composing it. This redistribution of purchasing power involves an immediately created new pattern of demands and, therefore, of prices within which business people operate and it inevitably lands some in difficulties, making it impossible for them to meet their commitments or to continue as they have been continuing.

We have referred to the rate of interest as if there were only one. In fact, it would be nearer the truth to speak of an infinite number of rates. Since the rate of interest is a rate of discount of the future or anticipated value of a service it is clear that every point of time has its own rate, theoretically. Some only are stated in market reports but the differences between short term, long term, and medium long rates are evidence of the variety. A change in the rate of interest may, then, be a general change of all rates or a differential change, frequently, both kinds occur simultaneously. The variety of rates of interest and the variety of change that can take place make possible an even greater variability in the distribution of money's worth than we have hitherto considered.

In the administration of their resources business men reckon their resources as money's worth and operate within the price structure. This variability of volume of money's worth, then, creates a situation that is entirely different from anything that can occur in a natural economy, it is tantamount to a *variable volume of resources* and its effect on individuals in some ways is the same as such a physical variability would be. Each individual makes his plans and his commitments on the assumption of his possession of a certain purchasing power in a certain price scheme and both his assumptions are liable to be rendered false suddenly and extensively.

Finally, there is the condition of instability that is imparted to the monetary economy when the supply of new legal tender cash is automatically effected as, for example, under a gold standard régime. When a country is on the gold standard the law enacts that gold may be exchanged against currency (at the mint or central bank) at a fixed rate. New gold may find its way into the money stock of the country from other countries, from bullion stocks within the country or from gold mines.

As the community's supplies of goods and services increase there is an automatic fall of prices unless new money is brought in or a change in velocity or efficiency of circulation is effected and the fall induces many changes. Gold mines, for instance, attempt to produce more gold, for as gold prices fall the value of gold per unit increases and the gold mining companies find the purchasing power of their product increased. They mine more gold to take advantage of this increased purchasing power. Gold, however, cannot be produced exactly as required and the actual result in the market is a series of relatively large output periods followed by periods of relative scarcity and these show themselves in considerably magnified fluctuations in the relative amounts of money. The index number of prices during the nineteenth century shows this relationship in a series of fluctuations that are not difficult to correlate with the supplies of gold. Prices rose when gold production was relatively high and fell when it was relatively low. A gold standard, in the present state of knowledge of the production of gold and the control of money formation, inevitably leads to rises and falls of "price levels" with their concomitant dislocations.

It would seem to be a well established fact that money, automatically supplied in response to demand, is a cause of the periodic variations known as trade cycles<sup>1</sup>. By introducing the quality of elasticity of volume of resources which men employ, it makes the ordinary indicators of equilibrium administration imperfect in their operation. Men are induced to invest by a rate of interest which does not indicate the real possibilities of the market and so they are, for a time, misled. They are induced to produce goods in amounts appropriate to a given price scheme and a given distribution of purchasing power to find that both are changed<sup>2</sup>.

The conception of equilibrium which we have employed in this discussion is a conception of a price scheme and scheme of flows of money, goods, and services which are settled and stable. We have stated the grounds of our belief that there is a tendency towards equilibrium but we have shown that inevitable changes in factors operate which necessitate men changing the directions of their administration towards new equilibria. Economists, recognizing this inevitable change, have spoken of the equilibrium towards which men gravitate as a *moving equilibrium*, borrowing the term from mechanics.

Care is needed in the employment of this term. In mechanics it means the equilibrium of a group of forces moving within a wider

<sup>1</sup> Cassel, E., *Theory of Social Economy*. Layton, W. T., *An Introduction to the Study of Prices*.

<sup>2</sup> See note at end of chapter, p. 312.

system of forces, in economics it does not mean this. All that it can mean is that the equilibrial patterns towards which men direct their administration of resources are constantly changing, but this implies that they are continually running into a state of disequilibrium. We have suggested that when an individual himself initiates a change he may be regarded as moving from one equilibrium to another with something approaching to smoothness but when, to the individual, the conditions that necessitate his new orientation are external, the smoothness of his adjustment will depend on the rigidity or flexibility of his patterns. If his resources are highly specialized and highly inconvertible, if his skill is highly specialized and his age or means such that he is non-versatile, if he has made contractual commitments from which he cannot obtain release, his position may be one of acute disequilibrium. The possibility of the economic system pursuing a moving equilibrium and remaining in equilibrium throughout the pursuit assumes a high degree of flexibility, versatility, mobility or of substitutability of resources. We have shown that it is conceivable that changes may be so violent and so frequent that no degree of flexibility, conceivably possible, may be able to cope with them to the exclusion of disequilibrium.

There now remains for consideration a further conception of equilibrium, namely an oscillating equilibrium. Already we have discussed the phenomenon of trade fluctuations as a case of periodic disequilibrium and it is obvious that such periodicity may be regarded as an oscillating equilibrium. In an oscillating equilibrium the forces are never balanced in such manner that there is no movement but they are balanced in such a way that similar movements recur. Thus, in the trade cycle, there is a periodic overinvestment in capital resources in the boom followed by a periodic reduction of such investment though, on the average, the investment may, over a period, follow a steadily rising or falling or constant course.

A certain oscillation of supply and demand and, consequently, of prices, in a particular market, may be set in motion by an inevitable overreaction of the suppliers of a particular commodity due to their ignorance of one another's reactions. The price of the commodity may rise and every supplier may act as if he is the only one supplying or, in a lesser degree, as if he has a greater share of the market control than he has, with the result that an oversupply is produced. This is an oscillation of the type one finds on a boat when the crowd of passengers rushes backwards and forwards on the deck, "correcting" the list of the boat due to their wrong distribution.

Such oscillations as these, due to "error of judgment", may reasonably be expected in the course of time to damp down. They may be likened to the variations "over" and "short" of a gunner's shoots at a target, which he uses an indicators of the amount of correction he must make, he ultimately reaches the target range and producers may be expected to reach their "selling range"<sup>1</sup>

Recently, however, there has been suggested the possibility that elasticities of demand and supply and, therefore, elasticities of

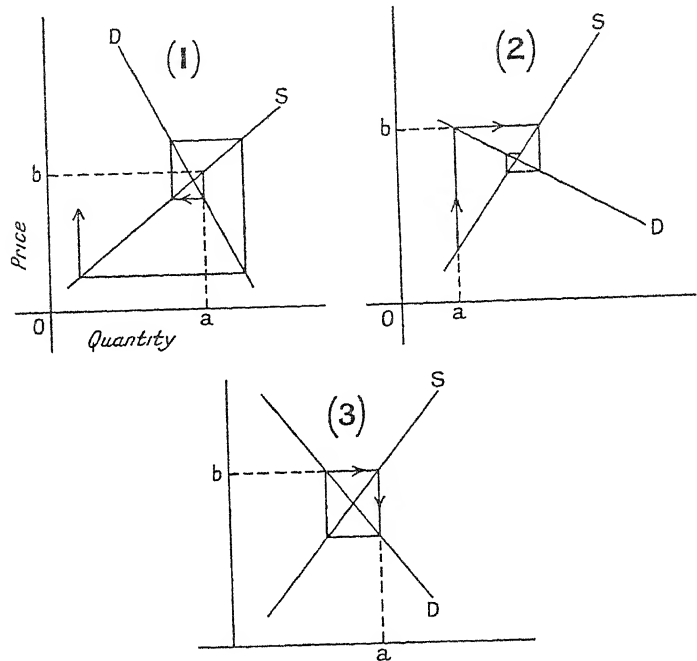


DIAGRAM II

substitution on all sides of the market may be such that prices and quantities supplied and bought may oscillate for an indefinite period of time. Indeed it has been suggested that the conditions of a market may be such that the supply and demand, of and for a particular commodity, may oscillate with wider and wider amplitude indefinitely, or with narrower and narrower amplitude until it is zero or it may remain constant

<sup>1</sup> Pigou, A. C., *Industrial Fluctuations*, Pt I, ch vi

Diagram II shows these positions. In case (1) the slope of the supply curve is less than that of the demand curve, in case (2) it is greater and in case (3) the slopes are equal. If, in each case, we start with a price  $b$  and follow the reactions of supply and demand, we find ourselves moving round and round the point of intersection of the curves. In case (1) the "spiral" is widening, in case (2) it is growing smaller and in case (3) it is a simple round, the successive points of equilibrium being repeated<sup>1</sup>

It would seem that case (1) is nothing more than a mathematical curiosity. It is inconceivable that the supply and demand of and for a particular commodity should continue to expand *ad infinitum*, such a situation would imply the ultimate substitution of all commodities by this one. Cases (2) and (3) would, on the other hand, appear to be quite possible; indeed they may almost be regarded as typical. We may regard all points of equilibrium as oscillating points, in the cases of narrowing or widening spirals they move to a fixed amplitude and what appears to be a fixed point may be regarded as an oscillating equilibrium whose amplitude is zero.

It may be asked if there is a tendency in the economic system to settle down to any real equilibrium at all. We have shown that men strive towards it, we have shown that at any given moment they act in a manner that is dictated by an equilibrium of expectations but we have shown that in some cases the most we can expect is an oscillating equilibrium and that in others men move inevitably into disequilibrium. In a world of perpetual changes, of a perpetual presentation of new situations, there can be no perfect equilibrium. The conception of equilibrium may be valuable as a methodological device but as a *description* of the actual state of affairs at any moment it is not valid.

It is not to be expected that there can be a perfect equilibrium in an economy in which interdependent processes and interdependent supplies are determined by the reactions of millions of individuals to their own desires, hopes, and expectations. The price of individual freedom in the market would seem to be a system liable to dislocations by wars and rumours of war, fiscal and military, new knowledge of methods of production, new fashions and tastes, new money and, finally, variations in the rationality of men's actions.

Habit and custom in the demands of people, the steady repetitive demands for replacement of resources in patterns desired over long

<sup>1</sup> Kaldor, N., "Note on the Determinateness of Equilibrium," *Review of Economic Studies*, 1934. Coase, R. H., and Fowler, R. F., "Bacon Production and the Pig Cycle in Great Britain," *Economica*, 1935.

periods, and the fairly steady physical conditions of supply of some of the more important resources (more important in the sense of their employing large quantities of people) may keep a large part of the system, so to speak, relatively steady, but all around this "core" of steady conditions it is doubtful if there can ever be a perfect equilibrium.

An individualistic system can, probably, only be conceived to work smoothly when all individuals have a perfect knowledge of what is to happen. Life in such a system would be a life of foregone conclusions; there would be no administration in the sense of freedom to choose, there would be no progress.

In a world where changes are perpetual it would seem that the condition of perfect smoothness must be the evolution of some methods of systematized change. The price of order, that is, would seem to be the sacrifice of a certain amount of individual freedom in the market. But this, along with certain other disequilibrating tendencies, must be discussed in the next section.

NOTE —The invention of a new product may lead to consequences that are of the nature of industrial crises. It is clear that on such occasions a reallocation of resources is required and this reallocation is, of course, caused by the reduction of certain prices and the increase of others. The mode in which the transference from one equilibrium to another takes place as the result of such an invention in a capitalistic organization has very important features.

When an economic system is in equilibrium, the organization of industry is of a simple, reproductive character. The "dimensions" of the industries supplying the various partly finished products along the line from raw materials to final goods is determined by, amongst other things, the durability of these materials and the durability of the specialized machinery employed therein. If an expansion of demand takes place the effect on these "production goods" industries is more or less violent, as we have seen below (p. 60) according to this durability; they have to produce for expansion as well as for maintenance or renewal. In times of transition, then, the organization provides expansion *and* renewal. When the new equilibrium arrives it settles down to renewal dimensions only. Thus there is a necessary "overexpansion" of productive power to move the system into the new equilibrium.

In an economic system employing the roundabout method of production, the industries which are functionally consecutive work synchronously. If the period of production is long—and especially if the period of expansion is long—there is a tendency for the impulse of new demand—expanding up to "equilibrium saturation"—to pass rapidly *along* the industrial structure, immediate growth of demand controlling *future* productive capacity. When "equilibrium saturation" is reached there is excessive

productive capacity as a result, and this shows itself in the disemployment of specialized labour and resources, in the higher reaches of production ("higher" in the Austrian sense)

This analysis, which bears some relation to Mr Robertson's suggestion in his *Study of Industrial Fluctuations*, and, perhaps, to Professor Pigou's suggestion of the influence of error in his *Industrial Fluctuations*, bears some relation in *consequences* to the Marxian theory of capitalistic crisis in several ways (see Marx, *Capital*, and Strachey, J, *Nature of Capitalist Crisis*)

In the first place, the more capitalistic the system becomes the more violent we may expect the dislocation due to "progress" to be. In the second place, the development of excess "capital" creates a "vested interest" demanding new markets—demanding further expansion if this excess is to be employed—this may produce "economic imperialism". If the disemployed resources are in particular localities, we have "derelict" areas which may cause governments to attempt to expand markets in the vain hope of making industry produce more than "equilibrium saturation" requires. This demand of the capitalist system for continuous expansion is, however, a "flaw" in the system with a *technical* basis and it will present itself in a communistic society if there is progress. The communist controlling body may have other ways of dealing with the social or "human" aspects of the problem, but it will have its times of "overexpansion disemployment". At the present time Russia is expanding rapidly her production of tractors, as the world is generally expanding its motor production. When the "equilibrium saturation" point is approaching, the production will have to approach the renewal production dimensions and there will probably be "vested interests" in continuing the expansion rate. The phenomena which Marxians claim to be explicable in terms of the labour theory of value and the *exploitation* of surplus value or unpaid labour are thus capable of explanation within the theory which they describe as "capitalistic economics" but the latter theory reveals analogous flaws in communist organization.





## SECTION V

### THE SOCIAL ECONOMY

#### CHAPTER I

#### THE ECONOMIC NECESSITY OF LAW

We have already pointed out that the process of administration is the process of making patterns of material resources and we have shown that the essential condition of pattern making is that man shall be aware of the possible juxtapositions of things in the future. For man to be aware of possible juxtapositions in the future it is necessary that he shall know how the external world, upon which he operates, will "behave". Unless there is some measure of uniformity of occurrence, which is the condition of forming expectations, there is no possibility of pattern making.

The economic significance of the physical and natural sciences lies in the fact that they enlarge the field of man's awareness and so make possible a more perfect equilibrium of his pattern making. To the extent that man does not understand the workings of the physical world he cannot make his patterns. he may react to certain physical conditions but he cannot direct their arrangement towards some foreseen end. It is, then, an essential condition of economic administration that there shall be uniformities in Nature or that there shall be *natural law*, making prediction possible. Not only is natural law essential—using "natural" in the sense of things being external to man—but it is equally essential that, when men live in proximity to one another, there shall be a certain degree of uniformity in their behaviour, a certain quality in their behaviour that will enable them to predict one another's reactions to certain situations. When men live in proximity to one another they constitute "mutual environment"; to every person the behaviour of others is a part of the activities which must be incorporated in his own pattern of administration.

The economic significance of the sciences which study human behaviour, such as biology, psychology, ethics, æsthetics, is, then, precisely similar to that of the physical and natural sciences. They reveal certain uniformities and make prediction possible. They discover, in short, natural laws of human conduct. Unless there

is some degree of uniformity in human behaviour, men cannot make patterns of resources, they cannot administer through time, if they live in proximity to one another

It is not sufficient for a person to know the laws of behaviour of men and things if he is to make a pattern he must have the power to induce or make his environment conform to his desires. He must be able to set in motion the material things about him and he must be able to control the behaviour of other people. To a certain extent other people may behave in a manner that conforms to his wishes without any reference to these wishes, their desires with regard to the particular behaviour or disposition of resources coinciding. In the same way inanimate or animate Nature, other than man, may behave in an "approved" manner. Or there might be certain behaviour which is a matter of indifference. Control will only enter in an active sense if there is a possibility of uncontrolled persons or things behaving in a manner not conforming to the desired pattern.

Now immediately two or more persons are found attempting to control one another, either in person, directly, or with respect to certain material things external to them, we have a situation whose resolution constitutes socio-economic administration. Socio-economic administration consists in this, the determination of inter-individual economic pattern relationships. When one individual's desired pattern of administration encroaches upon or overlaps another individual's sphere of freedom, then an adjustment must be made which is a socio-economic adjustment. Social economics<sup>1</sup> then, is concerned with the determination of individual freedoms to use resources when a number of individuals are interested in one another's behaviour.

Since administration is, as we have already explained, a process which involves the allocation of resources through time towards an end which lies in the future, it follows as a logical necessity that there can be no administration towards an equilibrium unless men make their patterns conform to declared laws. They must know in advance what their fellows will do under certain circumstances, or, to the extent to which they do not know, their behaviour is irrational. Rational administration of the same resources by more than one person involves, therefore, the framing of laws.

The framing of laws is the determination of individual freedoms, freedom of person, and freedom to use resources ; to use the ordinary

<sup>1</sup> The term "social economics" is usually employed to denote the study of conditions of "social welfare" and includes the study of such subjects as insurance, old age pensions, housing, and other specific items of "welfare". Here we use it to denote the methods of adjustment of properties held by members of a group. Social economics logically includes exchange economics but excludes, of course, "Crusoe economics".

terminology of political science it is the delimitation of personal freedom and the "rights" of property. Since, in all declarations of these freedoms to behave (or unfreedoms), control over resources is exercised, it follows that the making of laws is a part of the process of economical administration. If we call law-making a political activity, then this political activity is also economic and its exercise is the prosecution of the principle of economy.<sup>1</sup>

When the patterns of resources desired by two (or more) persons are incompatible with one another, we have the situation which calls for socio-economic administration. The "tension" on the resources, which this incompatibility of desires establishes, may be resolved by bargain or by conflict. It is important to note, however, that, if the parties decide to have recourse to the arbitrament of arms, they make different assumptions regarding the freedoms severally possessed from those which they make if they proceed to bargain. The basic condition of bargaining is an *accepted* distribution of freedom or power, the basic condition of conflict is a *difference of opinion* regarding this distribution.

Bargaining, "political or economic", assumes a distribution of personal freedom and property, it is a process of modifying this assumed distribution, one freedom is given and another is received by each of the bargaining parties. In conflict the distribution is in question; the gaining of freedom by one involves a curtailment of the freedom claimed by the other.

Now it must be observed that we are not here concerned with the exposition of political theory, we are concerned with the examination of the conditions of equilibrium in the administration of material resources. It is clear that if what one author<sup>2</sup> has called the "transactions" between men fall into these two categories of "bargaining transactions" and "conflict transactions", it is an absolute condition of economic equilibrium that the "conflict transactions" shall first be resolved. Men cannot administer their resources towards any end with assurance unless they know, in advance, the freedoms they will be able to exercise in the future.

The necessity of law, then, from the economic point of view, is the necessity of "resolved conflict", the definition of property rights and the regulation of the conditions of bargaining. Since conflict is settled by the exercise of power, it follows that economic equilibrium can only be established through bargaining within a framework of law which expresses the equilibrium of power.

When an equilibrium of power has been established it is possible

<sup>1</sup> Beard, C., *The Econ Basis of Politics*

<sup>2</sup> Commons, J. R., *Institutional Economics*. See also articles on "Institutional Economics," *Am Econ Review*, 1931. Professor Commons has other transaction categories as well.

to conceive of a final equilibrium being established within the data of that moment of time and within the field of awareness or understanding possessed by the members of society with regard to the properties of resources and the price scheme. It is important to note, however, that though this conception of a given legal framework is valuable methodologically,<sup>1</sup> in that it enables economists to study the exchange system, the legal framework in the actual world of affairs can never be assumed as fixed. The process of living is a dynamic process and new data are for ever appearing. New resources, new distributions of resources in the physical sense, new knowledge, new purposes of individuals and groups produce new schemes of possible conflict and impose the necessity, assuming the pursuit of equilibrium, for a new legal framework—or, at least, a modification of the framework. The principle of economy, then, requires that not only shall men be free to administer their property within a given legal framework, but that this framework shall be continually modified. The distribution of power is a moving distribution and an equilibrium of power is also a moving equilibrium.

It follows from this discussion that a study of the social economy involves a study of the establishment of this equilibrium of power, the definition of property freedoms and the regulation of contracts. The discussion of the pricing system within an assumed distribution of property and assumed contract law is not a full discussion of the social economy. Economics must include socio-economic administration in the sense of making laws as well as “using and exchanging” the freedoms allowed by the laws.

This is the main contention of this chapter. The forces which operate within a social economy are those which determine the distribution of accepted property and personal rights as well as those which determine the price ratios of the market. The resolution of conflicts of will by the definition of accepted freedoms as well as the adjustment of incompatible desires by exchange of accepted freedoms are parts of one unified system of administration. There can only be equilibrium in the socio-economic system when there is equilibrium of power resolving conflicts and an equilibrium of “advantage” through exchange.

In the actual process of living it is easy to distinguish some activities as conflict and others as bargaining but, if we abstract the specific qualities of the activities we may see that, fundamentally, there is a similarity. We accept the statement that before exchange takes place there must be a scheme of property distribution, a scheme of recognized freedoms. Conflict assumes a

<sup>1</sup> Robbins, L., *Nature and Significance*, ch. vi.

scheme of power distribution and, for a person to possess power, he must have control over means. In conflict, then, men employ resources over which they have actual power, and when they reach an equilibrium they have used their resources in the "optimum" manner. Bargaining and conflict are modes of mutual inducement and the fact that in one the inducement is "advantage" and in the other it is "disadvantage" does not mean that fundamentally they are not similar. This fundamental similarity is recognized when we speak of bargaining *power* in the ordinary exchange process.

We are now in a position to explain the place of the State in our social economy, from the point of view of the economist. The primary function of the State is the making of laws, the definition of the freedoms and limitations which the members of the community may exercise or must observe. It is concerned with the resolution of conflicts amongst individuals, with the resolution of those conflicts which, if there were no State, might be settled by an appeal to the arbitrament of force. In other words the function of the State is the prevention of private conflict in the form of forcible control of one person by another, the imposing of one person's will upon another against that other person's will.

The State is an institution that claims the monopoly of force<sup>1</sup>. In actual fact, of course, it is not absolute. It can only exercise the power which it actually possesses and this depends upon the nature of its decrees—or its lack of decrees. What the State does is the behest of supreme power and the will of this supreme power is its limit. When States forget this limitation they are overthrown by what is legally regarded as revolution, from the economic point of view, however, revolution is but an assertion of a supreme power, if it succeeds.

From the economic point of view, then, the State is primarily the institution for the determination of conflicts. Fundamentally, however, its decrees are the expression of equilibrated power: they are the declaration of property and personal rights by the power which lies behind the State. The types of decrees promulgated depend upon the ends envisaged by those who have the power, the extent to which people realize their power and the understanding which they possess of the reactions of their decrees, immediate and ultimate<sup>2</sup>.

<sup>1</sup> All theories of the State accept this, from Hobbes to Green and Hobhouse. The differences amongst the various theories are concerned in part with the method by which it obtains the power.

<sup>2</sup> Beard, C., *The Econ Basis of Politics*. Laski, H. J., *Grammar of Politics*, chap. 2. The argument that the power of the State is an expression of the equilibrium of power in the community seems to imply (a) Professor Beard's argument (from his six philosophers) that political power is determined by property—since property itself is an expression of the same equilibrium, (b) Professor Laski's pluralistic sovereignty, since all interests have property, the freedom allowed by equilibrium of power.

## CHAPTER II

### THE ADMINISTRATION OF JUSTICE

In the preceding chapter we have attempted to show that the characteristic function of the State is a necessity of an exchange system. Its necessity arises out of the fact that there can be no real tendency towards equilibrium in an individualist bargaining system unless there is an accepted scheme of property distribution and provision is made for the adjustment of this primary scheme so that there is no overturning of the system effected through the "centre of gravity" of sovereign power shifting. It is the function of the State, as an agency of administration towards equilibrium, to control the distribution of property in the direction of an equilibrium of acceptance. This function we propose to call the administration of justice.

It may be objected that such a conception of justice is inadequate and that an economist in any case has no qualification to speak of justice since it is in the category of moral relationships and its use implies that the economist can say what men *ought* to do. No such claim is, however, here made and, while we are aware of the possibility of other definitions of the term "justice", we claim the right to use it in this sense for want of a better word. There is no claim made for our competence to say what *ought* to be done, the claim is much more modest, namely, that the State, being an organ of expression of the sovereign will (in the manner described in the preceding chapter), does in actual fact adjust property relationships in such a way that it hopes will not cause its own dislocation. Justice, then, is here considered to be nothing more nor less than that allocation of freedom to use resources, or that allocation of property, which sovereign authority decrees.<sup>1</sup>

The discussion of the economic aspect of State activities has in fact, always been somewhat confused because writers, including many economists, have failed to appreciate sufficiently clearly the difference between justice as a conception of what *ought* to be done and justice as what *is* done by sovereign authority. The economist has no authority to enter into the discussion of the desirability or undesirability of any particular activity of the State; his function is to discuss the principles upon which states act just

<sup>1</sup> Cf. Pigou, A. C., *Public Finance*, pp. 5-18.

as he discusses the principles upon which individuals act in the administration of material resources. The State *is* and *does* just as an individual is and does and the economist can no more say whether the State should spend its money on warships or the feeding of school children than he can say whether men should be herbivorous or carnivorous. Questions of ultimate valuations are not his to answer.

Except in the discussion of the reactions of State activities on the price structure and general organization of the exchange system—usually treated as the “incidence” or “effects” of taxation and public expenditure—the studies of public finance almost always include considerations that are, properly speaking, irrelevant in economic studies since they are considerations of the ultimate values of certain activities and ends.

It is universally held by students of public finance—which is that part of politico-economic science that treats of the activities of the State—that the first function of the State is to provide for the defence of social life. Usually the function is stated in the form of an imperative, the State must or should provide for the defence of social life. The kinds of defence are stated to be defence against internal and external foes.

Though it is legitimate for any person to say what he considers the State must do it is not for the scientific worker to lay down injunctions and in this case students of public finance almost without exception break this rule of scientific procedure. That the State does provide defence is a fact of observation; the State is the institution which performs this function. It is the definition of the State that it is the institution which defines property rights and enforces them by the employment of physical power, and the definition and enforcement of property rights is the defence of the social system, the police and military institutions which it maintains are the physical means whereby it enforces the observance of its decrees. If the State has jurisdiction over one part of the earth only it follows logically that its maintenance of the property distribution within that area involves its defence against external attack as well as its defence against internal disruption.

Sometimes it is urged that the defence of the social system means the suppression of “private” employment of force within the area of jurisdiction and the repulse of physical external force and it is argued that the State must maintain its authority. Again, however, there is no need to use the imperative “must” because the State, as the institution which defines and enforces property distribution is the institution which possesses this power. If it loses the power it loses its status and those who have the supreme power become the

State, whether they be called revolutionaries or conquerors. It is, however, a tendency of States, as of all institutions, to attempt to maintain their authority.

If this last observation is true it would seem to follow that the use of the term "defence" hardly covers the function of the State. When we speak of defence we normally mean defending something which is, but, in actual fact, if a State attempts to maintain its authority it can only do so if it is prepared to *alter* the property distribution when at any time the forces against the given distribution are likely to overthrow it. In other words, the State only maintains its authority so long as it maintains power. If a State declares its law to be a "law of the Medes and Persians which changes not", it heads for disaster, sooner or later, the condition of the continuity of a State is that it changes the law. Those therefore, who urge that the State *must* maintain the supreme physical force must also, of necessity, urge that the State *must* be prepared to change the social system. In fact, States do reflect the wills of the changing powerful group or, in other words, they reflect the changing equilibrium of power in their decrees.

It is appropriate, at this juncture, to introduce what may appear to some readers to be a digression on the economist's attitude towards the employment of physical force, either in the revolt of groups within a community or the suppression of law breakers or, in the usually more extensive uses of physical force, in wars. It is sometimes said that the employment of physical force is not economical and wars especially are denounced as uneconomical.

The economist, as we have frequently iterated, cannot say which particular activities of men are economical or not; he must, however, admit that if men consider that the only way of attaining their ends is by the employment of force then, when they employ it, they are acting on the principle of economy.<sup>1</sup> As we pointed out in the last chapter, conflict is one method of resolving incompatibilities. It may be that according to some tests men in going to war make wrong ultimate valuations, considering such things as national honour too high and estimating the pain and dislocation of ordinary living too low, but, assuming these valuations to be correct—and the economist's function is not to judge—then war may be regarded as a manifestation of the principle of economy. There is a point, however, on which the economist and pacifist are in agreement: if men conduct themselves irrationally, if they act under impulses without weighing the cost, then their activities are not economical. There can be no question of economy—of moving into equilibrium—when action is irrational. War, there

<sup>1</sup> Robbins, L., *op cit*, pp. 7 and 15.



is no doubt, is an activity which gathers its greatest force from the irrational elements in men nations throw their citizens and their resources into destruction and do not count the cost ; they do not think of the alternative uses which could be made of them. This is probably the point upon which the distinction between police and military activities can be made . in the one case physical force is employed rationally, as a rule, and in the other case it is employed irrationally.

The second function of the State is very generally held to be the fostering of conditions that are conducive to social well-being<sup>1</sup> and, in particular, the State is charged with duties regarding health, protection of society against pests, fires, and such calamities, and with the elimination of ignorance. It is customary in this case for authorities on public finance to state this function also in the form of an imperative. Again, also, the economist can have nothing to say of an imperative character. Many States do, in actual fact, undertake these and other activities regarded as conducive to social benefit, but the pronouncement of the activities as socially beneficial is no part of the economist's function. All he can say is that the activities performed express the will of those who give the State its supreme power to perform them.

Social benefit we have frequently pointed out is something whose quantity cannot be measured. It is not a " social " experience since experience is individual and individual experiences of satisfaction cannot be added together to make a social total. Social benefit does not consist of things , it arises out of the patterns of things and can only be conceived as that distribution of well-beings of individuals which exists at any moment derived from their relations with the patterns of resources about them. Perfect social well-being would be that distribution which would exist if all individuals were in such a position that they desired no change and, in addition, were in such a position that they could not be persuaded to desire any change.

The social services which a State undertakes are those which the supreme authority decrees. It is not for the economist to say which services it shall supply. An old precept of political economists was that the State should govern and not trade , the modern economist, eschewing final judgements, cannot lay down such a precept. If the State " wishes " to trade, it will trade : if it wishes to make a profit, it will do so ; if it wishes to trade at a loss and meet the loss by raising taxes, it will do this also. The State does that which it wishes to do.

<sup>1</sup> Dalton, H. , *Public Finance*, pp 7-15, ch. 11. See also Laski, H. J. , *Grammar of Politics*, ch. 111.

Some writers have suggested that the State should perform those services which it can perform more efficiently than individuals can perform them. Such a precept implies that it is known how to measure efficiency in an objective way and this we have shown is impossible. Efficiency is a conception which implies valuation and valuation has its origin in individuals. So far as the economist can say, that which the State does it does because it considers itself efficient in doing. What it does is the result of individual demands working through the political system, demands which are, in themselves, quite as "legitimate" as the demands that operate in the market.

We may now turn from the consideration of the general functions of the State and consider the relations between economics and that part of the study of public finance which is concerned particularly with taxation and the distribution of public services. The literature of this part of public finance bristles with moral precepts and though, in many cases, the writers state explicitly that they make certain assumptions concerning what is and what is not right, there is no doubt that the precepts are issued by many as if they were statements of what is and what is not economical according to tests which economists are presumed competent to apply.

One of the most commonly asserted maxims is that the State should levy its taxes and disburse its benefits according to some principle of equity. Some writers have urged that taxation, for example, should be levied in proportion to income<sup>1</sup>; others have urged that it should be levied in such manner that taxpayers suffer "equal sacrifice" and this it is held involves some scheme of progressive taxation, another suggestion is that it should involve the minimum sacrifice. Now each and all of these are based on some notion of what is right in a moral or other ultimate valuation sense, but they all neglect to consider that there is no guarantee that any of them will maintain stability of society, will maintain, that is, the general acceptance of the distribution of property involved.

To tax people in proportion to income may be "right or wrong" but if the actual distribution of income is such that sovereign authority is of opinion that the wealthy must have their incomes reduced and the poor must have their incomes increased, relatively, then proportional taxation will not be imposed. And so with "equal sacrifice", if the sovereign authority requires "greater sacrifice" from some and "small sacrifice" from others, then "unequal sacrifice" will be imposed. The just distribution that is in actual fact imposed is that which sovereign authority wills. The state of

<sup>1</sup> Smith, A., *W of Nations*, p. 347, bk v, ch. II.

affairs which holds in war time illustrates the point. In time of war the sovereign authority is concerned with the prosecution of a successful war; no question of taxing according to income or according to sacrifice is really seriously considered. Everybody is called upon to yield service according to capacity.<sup>1</sup> Ability to serve is the criterion of taxability and that principle is pronounced just.<sup>2</sup>

In like manner, if some wave of enthusiasm passed over the country in favour of the abolition of slums, then the sovereign authority would take steps to implement these ends and questions of equality of sacrifice or percentage reduction of income would not be considered as of prime importance. The State would attempt to effect its ends and what it did would be just in the sense of the definition employed in this section.

That distribution of freedoms or property rights is unjust which stands in the way of sovereign authority attaining its ends and sovereign authority will always remove these injustices. To define the nature of the specific injustices which States should remove or should not create is to define the content of the will of the sovereign power and that is not the function of the economist. Injustices are simply those distributions of freedom which are incompatible with the attainment of equilibrium by the sovereign authority and they are situations which, of their nature, tend to be dissolved. Proportional taxation, progressive taxation, degressive taxation or regressive taxation cannot be pronounced good or bad by the economist, though they may be good or bad by criteria which the economist cannot apply.

A second principle generally maintained is that taxation should be levied according to the benefit which a person receives from State protection or other activity. Adam Smith said that this meant that a person should pay according to the property he enjoyed and this he measured by income received. To him the function of the State was the maintenance of property, and therefore, logically enough, this police function should be apportioned in cost on joint stock principles of allocating costs according to shares. It is clear, however, that the assumption here made is that the distribution of property at any given moment is the distribution that must

<sup>1</sup> The definition of "indispensability" and "service of national importance" caused much discussion.

<sup>2</sup> The distinction between the ordinary principle of "taxation according to ability" and the principle of "ability to serve" should be noted carefully. The former has reference to the taxpayers' individual sacrifice of satisfaction, the latter has reference to his ability to serve an end of the State and "sacrifice" is not counted. No one would contend that in the last war personal sacrifice was much considered under conscription rules.

be preserved, subject only to the modifications introduced by voluntary exchange of property. This assumption is a judgment of what ought to be in the mind of sovereign authority. The only thing we can assume about the sovereign is that it will do what it wills. The continuity of the authority of the State can only be guaranteed if the State, representing sovereign power, changes a distribution which will destroy itself. The function of the police is to maintain a given distribution, the tendency of the State is to maintain equilibrium and *may* involve taxation on any of the possible principles given above.

In recent years there has been a tendency to regard the first principle of public finance or State administration as the principle of economy.<sup>1</sup> This principle has been interpreted as the principle of smallest costs or the principle of maximum satisfaction so that each "transference" of property is from a place where it gives a smaller satisfaction to a place where it gives a larger satisfaction; it is regarded as the application of the principle of substitution until, in State administration, as in individual administration, there is a condition established of equimarginal substitute returns.

As we have said above there is no method whereby the satisfaction of one individual can be compared with that of another and it follows, therefore, that the application of the principle of economy in this form is impossible. Men may make arbitrary assertions that the loss of a pound to a millionaire is less significant than the loss of a pound to a person with one hundred pounds but it is an arbitrary assumption incapable of proof.<sup>2</sup> To demonstrate that the principle of economy is the principle of State administration it is necessary to define the principle in a manner which is not usual but is, nevertheless, we claim, universally applicable.

When we discuss economy from the point of view of an individual or a business firm we invariably think of it as a process of giving up as little as possible in order to attain a given end. Thus we sacrifice the smaller satisfaction in favour of the larger satisfaction, we refuse to pay a higher price when we can obtain our result for a smaller price. When we are considering an actual business proposition we can, with a given price scheme, calculate objectively the economical line to take because we assume the size of profit in terms of money to be the measure of advantage. When we consider individual economy we must accept the valuation of the individual himself concerning both costs and returns but we assume that he will take the economical line. The line of economy, however, is

<sup>1</sup> Dalton, H., *Public Finance*, p. 9. Jones, T., *The Nature and First Principle of Taxation*, pp. 161-182.

<sup>2</sup> For a suggested explanation of its reasonableness see Appendix, p. 355.

simply the line which a person or group takes as he tends towards equilibrium. If a person does not pursue equilibrium he does not pursue economy and vice versa. Economy is simply a particular mode of thinking of a tendency towards equilibrium

If, now, we turn to the administration of resources by the State, if we think of the sovereign authority issuing its decrees concerning the liberties that individuals and groups may enjoy, we see it acting in the direction of equilibrium. In its pursuit of equilibrium it is pursuing economy and, in the administration of resources by sovereign authority, we discover the identity of *justice* as defined in this chapter and *economy* which is regarded as the central subject of discourse of economists. The function of the State is to administer justice. The administration of justice is the pursuit of economy. The making of the framework within which individual enterprise operates is, then, once more, demonstrated to be a part of the economy of society

When it is accepted that rights of property are freedoms to use resources, allowed or granted by sovereign authority, it follows logically that it is useless for the economist to attempt to classify activities which are appropriate to State action. The State, the organ of sovereign authority, will do just what it wants to do. Those whose business it is to say "This is better than that" can say what the State ought to do and what the State ought not to do, but the economist is not among this number. Though the economist studies the implications of the principle of economy he has no means whatsoever at his disposal of deciding which activities are and which are not economical. He may "talk about it and about" but he can never identify economical action.

Nevertheless there are economists who discuss "economic ills", who pronounce "economic judgment" upon certain situations, saying that they are "uneconomical". These economists are, broadly speaking, those who treat the subject normatively, and define certain "social quantities" as quantities to be maximized. The social quantities may be "social happiness", the matter of central interest to the Utilitarians, or "wealth"—material property—the matter of central interest to the Classical writers, or economic or material "welfare", the modern conception which corresponds to the former two conceptions. With these quantities in mind they point to conditions that prevent maximization and, of course, these conditions are "uneconomical", and may be regarded as "social ills". We may say, for instance, that these authorities are generally "in favour" of free-trade, as an "ideal" international economic condition, and, also, that they are "against" various forms of monopoly. Some hold that "inequality-of-income"

produces something less than the maximum social satisfaction and some indicate conditions of "exploitation". As a result they present cases and policies appropriate to State action, such as the removal of tariffs, the control or abolition of monopolies, the reduction of inequality and the prevention of exploitation.

Our approach, not being normative but positive, makes it necessary for us to consider these conditions in a different way. We are concerned with the conditions of equilibrium and disequilibrium. We reject the concept of "social quantities" and consider the balance of forces. We are not concerned, then, to show what the State ought to do, but, rather, to show what the State will do, given certain conditions, since the State, like other institutions "operates towards equilibrium". The difference between the approaches of the economists to whom we have referred and our own we may make clearer by considering some of these ills, and we propose to discuss shortly, monopoly, inequality, and exploitation.

*Monopoly*—Throughout the literature of monopoly and competition it is generally assumed that the monopolist is one who has freedom to produce as much or as little as he likes or charge what price or prices he likes, the limit being fixed by a consideration of the maximum profit to himself. The competitor, on the other hand, has no liberty in the fixing of price and can only control the amount which he will place on the market at the ruling price, it is assumed that there is a limit fixed in some peculiar way to the profit he can make. When a monopolist charges discriminating prices, attempts are made to demonstrate that he really takes away something from the purchasers who pay the high prices and, by implication, he is regarded as a plunderer. Though economists have demonstrated that, under certain highly abstract conditions, production under monopoly may be greater than under competitive conditions, it is a further general belief that monopoly means restriction of supply or the making more scarce of services which men desire. For all these reasons there has developed the idea that monopoly can be shown by methods of economic science to be economically bad, that is, that monopoly can be demonstrated as uneconomical in the exchange system.<sup>1</sup> It will here be attempted to show that all these judgments lie outside the field of the economist's competence.

In the first place, it should be noted that the so-called freedom of the monopolist to regulate his output or adjust his charges, as he pleases, in contrast with the competitor who can only adjust his output to a given price, does not exist. Since we assume that

<sup>1</sup> Plant, A., *Journal of Institute of Transport*, vol. xiii, p. 127. "The Economic Aspects of Copyright in Books," *Economica*, 1934. "The Economic Theory concerning Patents for Inventions," *Economica*, 1934.

the enterprise of an individual leads him to pursue an equilibrium which is determined by the maximum "net revenue", it follows that the monopolist, like the competitor, is regulated by the price scheme. The profit he can make lies implicit in the price scheme and if he acts according to the principle of economy he takes this, no more and no less. Both his output and his price are dictated by this principle.

The fact that, in perfect competition, a competitor receives no "net profit" has nothing to do with the issue. A monopolist, even, may make no net profit under some circumstances. Nor does discrimination mean that the monopolist has greater freedom to fix prices. Discrimination may or may not pay the monopolist; its necessity, assuming the principle of economy to be observed, lies in the price scheme. The competitor cannot discriminate, it is said, but the correct way of expressing this is that in perfect competition his discrimination is zero. In some cases, if a monopolist did not discriminate, he would not be able to exist at all.<sup>1</sup>

In the second place, it must be observed that it is impossible to demonstrate whether, if monopoly were more general, output would be restricted or not. The usual method employed in such attempts as are made is to construct a supply and demand figure under conditions of perfect competition, making arbitrary assumptions concerning the variations of costs of production with output and the variations of demand with price and showing the equilibrium price. Then, making another arbitrary assumption that the conditions could be made monopolistic and the relations of costs, outputs and selling price possibilities remain the same, the differences in equilibrium output and price are regarded as due to monopoly. The argument is not really valid. The figures may be used to show the pricing mechanisms of monopoly and competition but not the comparative prices and outputs, unless *in fact* the price situations are identical and it most usually is not. Monopolization usually involves a complete change of the price situation. The method, has, of course, also been used to show that under certain conditions monopolization may lead to a fall in price and an increase of output.

But even if it could be shown that, in a particular case, an increase of monopolization may cause a restriction of output it should be noted that all attention is concentrated on a particular commodity. Exchange is a double way transaction and if there is a restriction in one direction there may be an expansion in the opposite direction. The monopolist is a member of the community and if he restricts his output he does so presumably because he can only find his

<sup>1</sup> Robinson, Joan, *Econ of Imperfect Competition*, p. 203.

equilibrium in that way and so he can only receive the maximum service from his customers by such restriction. Accepting for the moment the legitimacy of the *restriction* interpretation, we must make allowance then for the *expansion* of the monopolist's means of enjoyment or resources in general

To prove that the net result of monopoly in a community means the restriction of product in general it is clear then that some means would need to be devised of measuring the total production. This cannot be done since the variety of production makes the arithmetic impossible. If the profit is measured in money's worth, again the demonstration is impossible because money's worth depends on the price scheme and the price scheme may be entirely different under monopoly and competitive conditions or under conditions of more or less monopoly or competition. We cannot make a total of social satisfaction because satisfaction is individual and subjective

Just as there are those who claim that monopoly restricts output, so there are those who claim that competition leads to a similar result by "wasting" resources. The familiar case of a score of bakers and sellers in a town doing work that could be done by two or three is an illustration of this case. The score of suppliers have, each one, their bakehouse, shop, and delivery equipment, and if the work were brought together the quantity of resources employed could be reduced and so we would have greater economy. The resources "saved" would be available for production of other things

This case would seem to be a very strong one since it is an obvious line of economy for each baker to try to reduce the proportion of his input to output but we cannot argue from the particular to the general. It may be true enough that the grouping of bakeries would reduce the quantities of certain resources employed, but we must observe that we have taken a particular viewpoint from which to make our judgment. The product of industry in general, so far as our competitive bread industry is concerned, consists, not only of bread, but bakeries, and any reorganization would mean, not more production necessarily, but a different pattern of production. An independent bakery is not the same thing as a share in a larger bakery, even assuming it to be made by amalgamation.

It is true that we can eat bread and that we cannot eat bakeries ; it is true that the technical purpose of a bakery is to make bread and the value of a bakery is derived partly from the value of bread. It is untrue, however, to assume that it is necessarily more economical to have one bakery rather than ten. Within the framework of laws and customs the exchange system is actuated by individual



enterprise and, since it must be assumed that each person aims at the best pattern of living which he can produce, it must be assumed that our bakers prefer to remain in competition with each other rather than combine. They apparently derive some satisfaction from this state of affairs which they think they would lose if they were made to combine. They may be "wrong" but we cannot consider mistakes as conditions holding in equilibrium. If they were convinced that by combining they could sell bread more plentifully and cheaply they might, from a sense of social duty, do so, but the actuating force of a social system is the desire of men to do what they consider best.

It is clear that if bakers are compelled to combine they will make a sacrifice which they will regard as a deduction from their satisfactions; at least, some of them will. Certain writers claim that they should be compelled on the ground that their dissatisfaction will be more than compensated by the additional satisfaction that others will obtain. This, we have already shown, is a judgment based on an arbitrarily made assumption that satisfaction of different persons can be equated and it is not capable of proof. The same situation arises if we consider the dissolution of a trust. The trust authorities object to such a dissolution as a curtailment of their satisfaction but the dissolving authority claims that it is increasing the satisfaction of others to a greater extent.

The State, at various times, has been called upon to check the growth of monopoly and, at other times, to check "excessive" competition.<sup>1</sup> When it has done either it is, presumably, because the sovereign authority has been mobilized behind the decision and this decision has carried sovereign authority because those who control it have some objection to monopoly under certain conditions and to competition under certain conditions. The fact is that both monopoly and competition can exist in such forms as to "interfere" with the liberties of certain individuals and groups and they can exist in such forms that these individuals and groups will combine to enforce some redistribution of "freedom to use resources".

A consideration of the meaning of competition will make clear why there should be an opposition to its extension from some and a support for its extension from others, and it will also make clear why some should support monopoly and others should oppose it.

<sup>1</sup> During the 19th century the policy of this country was *laissez-faire*. The attitude towards monopoly is seen in the common law against "restraint of trade". To-day we have seen the rise of the rationalization movement and the State has entered to compel rationalization. Along with this there has been a revival of tariffs. See Cassel, G., *Recent Monopolistic Tendencies in Industry and Trade* MacGregor, D. H., *International Cartels* (League of Nations publication, 1927)

As we have said above, the basic idea underlying monopoly and competition is the absence or presence of substitutability. The monopolist is one for whom there is no substitute and the competitor is one for whom there is

It is obvious that a person's bargaining power is increased if there is no substitute to whom his clients can turn, so it follows that a person normally prefers to be a monopolist. Likewise, as a buyer, he prefers to be a monopsonist. On the other hand, if a person sees that a particular line of business is more profitable than his own he wishes to be free to enter it. Thus it would seem to be the desire of men to compete with others who seem to be enjoying better opportunities and to prevent others competing with themselves.

If monopolists and monopsonists increase their bargaining strength it follows that those who buy from them and those who sell to them are normally in a weaker bargaining position as a result of the unity of forces against them. Buyers, therefore, normally prefer competition amongst sellers and sellers prefer competition amongst buyers to monopoly and monopsony respectively. These competing claims show themselves in the deliberative assemblies of States. The question of monopoly and competition resolves itself, therefore, into a question of relative freedoms and it is settled by the balancing of power in the State. A decision concerning monopoly and competition is part of the primary allocation of property rights.

Monopoly and competition derive their significance from their relationship to social stability. Neither condition is incompatible with equilibrium in the exchange system, but the equilibrium of the exchange system may be out of harmony with the equilibrium of primary property distribution. Both conditions may, at various times, lead to a demand, supported by effective power, for their modification, and the modification of them must be regarded as the pursuit by the State of economical administration.<sup>1</sup>

*Inequality*—It is only possible to measure inequality in terms of money income received or money capital value possessed since there is no unit of measurement other than money which can be used. Satisfaction, freedom, and even real resources owing to their variety, are incapable of reduction to a common unit and so it is impossible to compare, without some assumption of an arbitrary character, the income or possessions of different persons in these respects.

<sup>1</sup> The best confirmation of this is seen in the proceedings of Chambers of Commerce, Trade Unions, and Trades Councils, and, indeed, all "organized interests." There is no clearly defined policy in any of these bodies with regard to monopoly and competition; they are, generally speaking, monopolistic with regard to their own selling interest and competitive with regard to their buying interests.

Some economists, however, make arbitrary assumptions and, consequently, make observations, concerning the significance of inequality, which are not valid, if economics is regarded as we have chosen to regard it in this book. One of the commonest assumptions so made is that the marginal utility of money to a person with large possessions or a large income is less than that of a poor person. From this the conclusion is drawn that a lesser degree of inequality than that which exists to-day would give a greater amount of satisfaction or freedom or welfare than that which is enjoyed <sup>1</sup>

It is perfectly true, and obvious, of course, that a removal of persons from a condition of physical need would raise their standards of physical fitness, and, one can admit, an increase of physical fitness would make those so benefited more satisfied. We have pointed out, however, that satisfaction is not simply one kind of feeling and, in any case, all satisfaction is subjective. There is no way of *proving* <sup>2</sup> that social welfare would be increased in this way if social welfare is to be regarded as a total welfare of different individuals.

Other writers, urging the "benefits" of inequality, claim that it is essential as a condition of maximum production of things. It is held that, unless people are allowed to receive different sizes of incomes, many of the higher grade recipients will reduce their efforts. Here it is assumed that it is possible to measure various physical outputs and, further, it is assumed that because people use their resources in leisure they are wasting them, the latter assumption is based on an assumption concerning ultimate values. It should be noted, however, that in some cases an increase of income would lead to increased efforts. Some receive such pittance that they are not able or are not willing to work hard for them <sup>3</sup>

Both of these lines of argument are invalid according to the test of validity which we employ in this book. It is the function of the economist in treating inequality to consider its relationship to the principle of economy. The principle of economy we have defined as the tendency to equilibrium so the question to be determined is: Is inequality incompatible with perfect equilibrium?

There is one group of economists which maintains that there is a fundamental disharmony in the exchange system which is due to the tendency of this system to distribute income (or capital) unequally, the inequality leads to a maldistribution of expenditure between production goods and consumption goods. Men are born different in capacities to acquire, the resources of the Earth are varied,

<sup>1</sup> Cannan, E., *Review of Econ. Theory*, pp 413-422

<sup>2</sup> See Pigou, A. C., *Econ. of Welfare*, p 107

<sup>3</sup> Tawney, R. H., *Minimum Rates in the Tailoring Industry*, p 133

presenting different opportunities to those who acquire them, the institution of property inheritance makes possible an exaggeration of the inequalities so established. In a system of private enterprise the race goes to the strong and the "equilibrium" of distribution is found in great inequalities.

The very rich, it is then continued, have means beyond their power of rational expenditure on consumables, their standards of living being socially determined and the expenditure necessary to maintain them being less than their incomes. This excess is inevitably *saved* and is available for investment. Not merely is it available for investment but it actually seeks and forces itself into investment in the production of production goods. Since this investment capital is not the result of a balancing of "future and present" desires, since it does not come into existence as a result of the savers preferring the future to the present, it cannot be regarded as equilibrated saving. Production goods are produced whether they are wanted or not; periodically, there is an accumulation of them which is in excess of the requirements of the market. Furthermore, since, in an equilibrated organization the income distributed is equal to the value of the consumption goods produced, it is held that refraining from spending leads to an accumulation of consumption goods unpurchased. The condition is described as one of overproduction of capital goods or underconsumption of the products of these goods, and a point is reached when the collapse of prices due to plethora of productive power (or shortage of purchasing power), causes the condition of disequilibrium known as a trade depression.<sup>1</sup>

It is difficult to see how such a situation can be regarded as inevitable in an exchange system. Assuming prices to be flexible it would seem more likely that this apparent stream of free capital would be employed to reduce prices of consumables continually and develop new kinds of production. Mistakes might be made by way of overinvestment in particular industries but these might occur if incomes providing the savings were not large.

Equilibrium in the exchange system we have seen to be determined by the equality of marginal substitution prices with the ratio of marginal utilities or marginal productivities and thus we have shown to be perfectly compatible with inequality of payments made to any person for any service or services rendered to society (or its market).

In our system of free enterprise the condition of equality is the circumstance of substitutability and, in a world where every person is

<sup>1</sup> Hobson, J. A., *Science of Wealth*. See also Keynes, J. M., *The General Theory of Employment*, for a new analysis of this type of disequilibrium, too recent to be considered here.

unique, it is impossible to conceive of a perfect equilibrium with a condition of perfect equality of money income or money possessions. Inequality would seem rather to be an inevitable result of freedom possessed in any degree at all.

If inequality is a condition of instability it is not within the exchange system itself that the instability is produced ; it is within the framework of law, custom, etc., within which exchange takes place. The possibility of disequilibrium through inequality is only to be discovered in a lack of fit of the actual distribution of property and the distribution which sovereign authority—the equilibrium of power—declares satisfactory and if it is to be attributed to inequality *per se* it is clear that sovereign authority must be of the opinion that inequality *per se* is not satisfactory. That sovereign authority may not be of this opinion is very obvious. The distribution of *power* is usually such that it maintains an unequal distribution of property.

The contention that inequality is a condition in which wealthy people *prevent* poor people attaining their ends is not really an argument against inequality as a condition of disequilibrium ; it is an argument proving rather that men resent their being thwarted by others. If a person sees that others have what he thinks would enable himself, or others in whom he is interested, to attain certain ends otherwise unattainable, there is a condition of stress established in the property distribution. the strain which the stress calls forth may be equal to it, greater or less, and the transference will take place or not take place accordingly. In rational administration of resources inequality, *per se*, it would seem, cannot be a cause of instability in the primary distribution of property, the only cause of this instability is the hindrance which one person's possessions present to another's attaining his ends. And this instability might as easily exist in a society of lesser inequality, leading to attempts to increase inequality.

It is sometimes maintained that the State, wielding the supreme coercive power, could impose a condition of equality of income and capital possessions but our analysis will have shown, it is hoped, that such a position is unattainable. If people have possessions, they have freedom ; if they have freedom to use resources they inevitably change the values of most of the things they employ and it is improbable, to the degree of certainty, that the changes can be proportional in all cases. To guarantee a continuous equality would necessitate the removal of freedom to use and this would destroy the values of things to all except those who held the supreme authority and dictated the uses of things. Dictatorships can produce equilibrium and they can impose an

equality of rations—but it would seem that the logic of such a situation involves the loss of liberty of those who do not dictate.<sup>1</sup> And the loss of liberty is not merely the loss of so-called economic liberty, but the loss of political liberty, for they are one

Inequality, it would seem, is an inevitable condition of freedom ; it is an inevitable condition of the administration of resources. That distribution of inequality—that distribution of property or freedom to use resources, reflected in money incomes or money possessions—will stand which sovereign authority, the equilibrium of power, decrees, and again we return to our statement that “ social satisfaction ” must be that distribution of satisfactions arising from the distribution of property which the State maintains, modified by the secondary distribution of property which it allows. Inequality is not incompatible with economy, but a necessary consequence thereof where substitutability is limited

The third so-called “ ill ” of our economic system, exploitation, we must consider in the next chapter. Its examination involves the development of another argument.

<sup>1</sup> *Economic Planning*, edited by Hayek, F A von Essay v, p 214

### CHAPTER III

## THE MULTIPLE FRAMEWORK OF THE EXCHANGE SYSTEM

In the first two chapters of this section we have considered the State as the institution, within a community, charged with the function of making the framework of laws within which individuals and groups may exchange their properties or use them in other ways. The distribution of freedoms which the State enforces by the use of physical power we have called the primary distribution of property, and the modifications of this primary distribution, effected by voluntary agreement, we have called the secondary distribution. We have suggested, therefore, that the exchange system may be regarded as a system in which men seek an equilibrium of persuasion within an equilibrium of power, but we have indicated that there can be no final equilibrium except on condition that these two equilibria are in adjustment with each other — the State and the exchange system are institutions making for the general power-persuasion equilibrium, (or, according to ordinary usage of language, the politico-economic equilibrium).

We have pointed out that economists, in their study of exchange theory, usually assume a "framework of law" within which exchange takes place and we have, further, shown that the pure theory of economy needs not, in fact, this assumption: all that need be assumed is that men exercise the freedom *which they can assert*. There is, however, an advantage to be gained in the study of our economic life if we make the assumption of a given framework of law, because it enables us to examine the relations between the institution which makes this framework (the State) and the other activities which take place within the framework, that is, the conception of a framework is a methodological convenience for enabling us to discover the "location" so to speak, of certain strains in the economic system. The "equilibrium of persuasion" that may be established within a given scheme of law may be such that the "distribution of power", which it brings, demands a new scheme of law. This new scheme of law must be established or the State disappears and is replaced by another.

Now the concentration of the interest of economists on the

exchange system has led them to pursue their studies on the assumption that there is a *single* framework. We, in this book, by taking as the field of economic study the whole process of man's administration of his material resources, cannot simply assume such a condition of things. There is a possibility that the given framework has, in itself, the possibilities of disequilibrium, there may be strains and stresses in the economic system which are located *within the framework* and not merely between the framework and the exchange system, though if there are any they will show themselves in the latter place too. In point of fact, this is the situation.

Political and social history abounds in examples of the struggle which represents the tendencies in men to resolve tensions established by the existence of more than one "framework of laws", or more than one "primary distribution of property rights". In times of civil war, the *de facto* situation is one in which two (or more) "state" institutions struggle for supremacy. In the struggle between Church and State in medieval times there is an outstanding case of two institutions issuing their decrees and establishing their "frameworks" within which men were to conduct their day to day transactions with each other. International wars are struggles of the same order: two or more "powers" in a war, attempt to resolve the tension of two "sovereignties" by resorting to the combat of physical forces.

The characteristic of a "framework of law" or a framework of "rights to use resources" is that it is enforced by some sanction, some power that overcomes the will of the individual. The legal framework is enforced by physical force; a church may enforce its decrees by excommunication and the threat of the wrath of God; a moral code may be enforced by conscience or by the disapproval of certain members of the community, and a code of honour may be enforced in similar way by social ostracism or other forms of power. If, in a given community, there are all these sanctions in operation it is clear that an individual may be regarded, in something which he does, as acting outside or inside of a variety of schemes of "rights". For instance, a man may be offending a Church law by taking interest on money while remaining within his legal rights. He may offend against a moral code by paying a wage which is less than a "living" wage and cause no offence to the State. He may sell goods on a Sunday against State law and some Church law and yet meet with social approval which strengthens him in his defence. If we represent by a circle the freedoms allowed to an individual or group by one of these authorities, we must draw a set of intersecting and overlapping



circles to show how his various activities stand in relation to various authorities.<sup>1</sup>

By analogy with our definition of "justice" in the last chapter, as the will of the sovereign physical power, we see that there is really a variety of "justices"—State justice, Church justice, moral justice, professional justice, and so on, to the end of the number of the "authorities" declaring codes of conduct. An action may be regarded as unjust by one standard or code, just by another, unjust by several, and just by several.

The multiplicity of "justices" or multiplicity of "circles of freedom" within which a person acts makes possible a situation in which a person may exercise "more freedom" than is "legitimate" by one standard and less than is "legitimate" by another. In so far as he takes more than he ought he encroaches on other's freedom: in so far as he takes less, he is "generous". If a person goes beyond the State law, he is a thief or trespasser; his action sets in motion the physical sanctions exercised by the State, through the police. If he goes beyond the moral law he is an exploiter but he is not necessarily a thief; immoral action sets in motion the sanctions of conscience, of public opinion, the Church, or other authority, declaring the moral law. If he goes beyond the professional "circle of freedom", his behaviour may be moral or immoral, legal or illegal, but it is unprofessional, and professional sanctions begin to operate.

The question which we have to consider is, What is the economic significance of these breaches of various codes?

If we assume for a moment that the framework within which men operate is a single framework of laws enacted by the State, it is clear that when a person clandestinely steals what the law has assigned to another or openly takes it by a show of force, he is rendering the law null and void: he is disregarding the framework. To the extent then that the framework is destroyed men cannot administer towards equilibrium. We have already demonstrated this amply. The possibility of theft, trespass, contract under false pretences, contract *in duress*, breach of contract, etc., is a disequilibrating possibility in a social economy; all these breaches of the law make it possible that men administer their resources towards certain ends only to be frustrated through their expectations of the law's observance being disappointed.

The conception of a multiple framework within which men operate enables us to perceive the possibility of some lack of equilibrium among the various sanctions. Physical force, social

<sup>1</sup> Taensch, Carl F., *Professional and Business Ethics*, see especially chapter iii, on "Morality, Law, and Ethics".

disapproval, etc., may be employed in the establishment of different codes of conduct or different schemes of freedom. Men vary in their responses to the threats of these various sanctions and, consequently, they vary in the extent to which they accept what others allow and, also, in the degree of freedom which they allow one another. An "equilibrium of sanctions" can, however, be attained in which the ways in which men *will* behave are known, and, in this case, economic equilibrium is attainable. In this "equilibrium of sanctions", however, it is possible that men may behave so that they observe one code of conduct and do not observe another. The exploiter is a typical example of this kind of person.

An exploiter is normally a person who does not break the law of the State but does break a moral law as asserted by some people. There is no necessary condition of disequilibrium in this person's conduct. He may be known as an exploiter and men may administer their resources as he administers his, to the best of their ability: they can attain equilibrium and the condition of equilibrium, an all-round equality of marginal revenues and marginal costs, can be established. If exploitation were a disequilibrium condition sanctions would operate to remove it: if, when an exploitation case is generally known, the sanctions do not move, it is because they cannot and, therefore, there is equilibrium.

The measure of advantage which a person gains from exploitation is the difference between what he gains by not observing the code and what he would obtain if he did—just as the advantage to a thief is the difference between what he acquires by stealing and what he would acquire if he did not steal. This cannot be measured as a rule, but the quantity which would need to be measured is this difference.

A person who behaves within the legal code and without his professional code is, from the point of view of the economist, similar to an exploiter. He takes what he can, according to the law, but he takes more than is regarded as legitimate by his professional brethren. There is no necessity for unprofessional conduct to be a cause of disequilibrium if it is known that the unprofessional person behaves within the law: the law gives certainty and men can act knowing the freedom he can claim. If, however, the unprofessional person is assumed to behave professionally, but does not, then, like a person who breaks the law of the State, he is a cause of disequilibrium.

It will be seen from our analysis that the only circumstance that can be interpreted as an "economic ill", that can be defined by the economist as an "ill", is one that makes impossible the full pursuit of the principle of economy. Such a circumstance must of necessity

be some flaw in the framework within which men exercise their freedoms. When men do not know the framework within which they operate they are in danger of administering their resources towards ends which are unattainable. They allocate their resources on the understanding that certain results will be attained and they attain other results. Monopoly, competition, inequality, exploitation, cannot be defined by the economist as "ills" because they are compatible with equilibrium and do not necessarily induce irrational activity. When there is perfect equilibrium, in the sense that no person can rationally decide to alter the employment of his resources lest he establishes a condition which, in his opinion, is worse or not so satisfactory, the situation is one that gives the most perfect scheme of satisfactions possible in the circumstances. Such a position, it seems to the present writer, is theoretically conceivable as compatible with all the special conditions he has just discussed.

There is one further observation which we must make concerning the framework of laws and rules of conduct within which men exercise their freedom. Many moral laws and rules of professional behaviour are couched in general and ambiguous terms. Ambiguity and vagueness are conditions of disequilibrium since, to the extent that they exist, the framework does not exist and men may interpret them differently and act towards positions in which incompatibilities exist. When the courts of law give precise rulings on appeal with regard to special cases, they make the framework precise. In the later Middle Ages the Church spent much time in defining the precise meaning of its anti-usury law: they spent their time, then, in making the framework certain.

The difficulties of ambiguity are well seen in the interpretation of the generally accepted rule that workers should be paid "reasonable wages". In the late Middle Ages when the "just price" was supposed to control the economic system there were courts or guilds that could decide what these were. The modes of settlement of reasonable wages and other values, employed then and to-day, show that "reasonableness" has to be settled by the employment of the forces that determine the framework.<sup>1</sup>

Ambiguity in defining the framework means conflict and it is only removed by the "conflict of sanctions" establishing an equilibrium of power.

<sup>1</sup> Commons, J. R., *Institutional Economics*. See especially the section dealing with "Reasonable Value". It appears to be the same concept as the *jus pretium* of the Middle Ages. See also Laski, H., *A Grammar of Politics*, p. 111.

## CHAPTER IV

### EQUILIBRIUM—THE END OF THE SOCIAL ECONOMY ?

We have taken as the field of economic inquiry the whole of human living seen as a process of making patterns in material resources. We have regarded as economic all those activities which are in any way directed towards the disposition of material resources in patterns and it follows logically that we have regarded as possessing economic significance all human institutions and activities. This has involved our interpreting the principle of economy in a more general manner than that which economists usually employ and it has also involved our regarding the activities directed towards the production of the "framework" of laws and codes, usually assumed as given by economists, as integral parts of the general process of economical administration.

Our analysis has shown that equilibrium in pattern making cannot be regarded as necessarily attainable "within a given distribution of property" but it has also shown that discussion of the principle of economy necessitates the assumption at any given moment of a given distribution of freedom and from this *de facto* freedom arise all activities—political, economic, and social, so-called, —and all the various legal, moral, or other codes of behaviour.

At any given moment there is an actual distribution of material things and every person is located somewhere, possessed of a certain amount of physical strength. Further, every person has a given set of psychological dispositions and he possesses a certain amount of knowledge of his possibilities. From this complex there arises his *pattern* of resources. Living in proximity with others, the overlapping of patterns leads to the establishment of an equilibrium of power, which equilibrium is made manifest in the scheme of personal and property rights. Within this scheme every individual administers his resources directly or by exchange.

The framework within which men operate, then, consists of (a) the conditions imposed by Nature, and (b) the conditions determined by the interaction of men's schemes of administration, the property distribution itself being determined within a framework, ultimately, of "natural capacities" of men and things. Thus the whole scheme of property making and property using activities of men is derived ultimately from data provided by Nature.

In an isolated economy the only framework within which a person works is the framework of his environment and his own personal qualities—his physical abilities and psychological dispositions and knowledge. By considering these as his framework we are able to see that changes in the framework may throw him into disequilibrium and the inadequacy of his awareness, both of the properties of his material environment and of his own personal qualities, may lead him into an undesired position. Changes in the material environment unknown to him in advance, changes in his tastes, knowledge, etc., may cause him to move into a position in which he does not want to be. In other words, these changes in his framework may lead to his dislocation, a condition in which he needs to effect great changes in order to establish equilibrium.

In a social economy, where one person is part of another's environment, it is clear that each individual is a source of possible disequilibrium to another. Changes in the mode of living, due to changes of knowledge, taste, power, may have serious effects on the distribution of property amongst the members of the community, and changes in physical environment and the price scheme, where exchange has developed prices, must also be added to the forces charged with the power of dislocating individual or group pattern-making. Even the process of exchange itself may lead to such a position that a new equilibrium of power tends to establish itself, a new primary distribution of property.

These factors in the social economy are the dynamic factors and it is important to note that all the dynamic factors reside in the framework within which the individual operates.

If this is correct it would seem to follow that perfect equilibrium can only be attained in a world in which all possess all knowledge, or in a world of absolute changelessness, or further, in a world of perfect mobility, convertibility, or substitutability of resources. In the first case all change would be known in advance and all activities would be directed in accordance with that knowledge: no dislocation or position not anticipated could arise. In the second case, absence of dislocation is implied in the condition of changelessness and in the third case, perfect substitutability would make possible an immediate equilibrium when any change took place, whether or not it was anticipated. It is doubtful if any of these cases would be of interest to the economist if it existed; it is a condition which interests him only as a theoretical goal towards which the system is assumed to tend in order that the relationships of the forces contending might be understood.

There is no real hope, of course, that any of these conditions named will ever be attained but men attempt to reach equilibrium

by establishing all three of them. They widen their knowledge or understanding of the universe about them; they attempt to build permanent elements in their patterns and they try to make things as mobile as possible, in time, space, and form, generally increasing substitutability. Ultimately, it is clear, their success is founded on knowledge and understanding. New knowledge and wider understanding may dislocate, but they are essential conditions of final equilibrium. Increasing awareness of the behaviour of men and things in the universe leads to increasing rationality of conduct.

Rational behaviour—*administration* of resources, as the economist sees it—is behaviour conducted within an awareness of the framework, the “natural” framework and the “social” framework. To the extent that men do behave rationally, then, they must have some knowledge of the conditions of a stable social structure, a stable scheme of laws. It follows from this that, if men behave rationally in the exercise of power, they attempt to lay down conditions which, in their opinion, will make for a stable social structure: they will attempt to control the social organization so that it behaves as they would have it behave, knowing that the type of organization can only be one that lies implicit in the actual data.

If, now, we suppose the State to be the institution which controls the supreme physical power in enforcing its decrees it is a logical inference, in so far as the State’s action is rational, that its decrees will be such that it can enforce—or, at least, expects to be able to enforce. It will tend always to preserve the peace—preventing private warfare or exercise of physical or other *power* in order that it may be able to control the distribution of power. The maintenance of law and order as well as defence against external attacks are purposes which every State pursues inevitably: these objectives are merely another mode of expressing the objective which we have hitherto discussed, the determination of the laws of property and personal freedom.

Social equilibrium is the best term which the economist can employ as the description of the objective of a State’s activity. In so far as the State is supported rationally, or derives its power from people who act rationally, it will legislate towards the solution and avoidance of conflict, directing its efforts towards the nearest approximation to social equilibrium that it can attain.

Increasing rationality of the behaviour of States depends upon the extent to which they who are in authority understand the nature of themselves and their fellowmen as well as the nature of the resources external to man. The services which the State renders are directed towards a general equilibrium as conceived by those who,

at any moment, give power to the State. The *raison d'être* of education, health, public assistance, and all the social services, is to be found in the rational attempt to establish a social equilibrium, to establish a scheme of freedoms and unfreedoms in the community.

In establishing the legal framework many laws may be enacted that have the appearance of political bargaining. Political bargaining is of the nature of rational employment of power. The parties to the bargaining may be in conflict but, knowing each other's strength, they compromise, bargain or log-roll.

The activities of the State sometimes appear to be the outcome of power, sometimes of bargaining or contract, sometimes of gift or concession or charity, and sometimes they are described as the means of establishing the "social good". From the economic point of view the social structure is seen as a complex of power equilibrium and exchange equilibrium established amongst men who behave more or less rationally.

Having now established the proposition that all socio-economic administration is the determination of the "framework" within which individuals may exercise their freedom and, also, that all "economic ills" are cases of incompatible elements in the schemes of freedom which members of the community assume, we must now state a third proposition, an understanding of which is vital to the study of the conditions under which social reorganization can be effected. This proposition is that the only way in which one person can influence another's activity is by altering this other person's "framework of freedom". Whether the change is effected by power or by persuasion it is effected by a change of the framework.

One of the most important groups of proposals for socio-economic reorganization upon which the appreciation of the meaning of this proposition sheds light is the group of proposals for regulating prices. Many suggestions are made which involve some sort of State fixing of prices and many of them are futile because they are made without a consideration of this fundamental fact. Some of the proposals are based on the old "labour" or "cost of production" theories of value which suggest the possibility of calculating equilibrium prices by reference to some objective, physical unit of measurement: the subjective conditions of valuation make these proposals invalid. Many of the other proposals would seem to be based on an inadequate understanding of the nature of a price and, in particular, a failure to understand the "location" of the framework and, therefore, the extent of the field of liberty within the framework. These are doomed to failure because they amount to the proposal of incompatible features in the

framework—and this produces disequilibrium, which is incompatible with rational administration

It will be recalled that in our study of the pricing process we emphasized the fact that the price structure is a system of ratios established through the actual scheme of exchanges and that, strictly speaking, every exchange produces a particular, unique price. We went on to show the relations amongst these unique prices and explained the conditions of equality of ratios. We were particularly emphatic that every single price was determined by the situation in which the particular exchanging parties found themselves. The purpose of the discussion was, partly, to show that every single exchange was an equilibrating process *at a point* in the system. We showed the unreal nature of the assumption that there is such a thing as the price of wheat, or the price of coal and we showed that price equilibrium meant an equilibrium of the innumerable individual exchange transactions.

This fact alone is sufficient, when appreciated, to cause the rejection of some of the cruder kinds of proposal for price regulation—those, for example, which suggest that there should be one price for one kind of commodity or one kind of work in all places and circumstances—on the supposed analogy of the uniform letter post charge for all distances within a country. Since price is a manifestation of the equilibration of forces *at a point*, to assume that a uniform price for all exchanges of a particular kind of commodity, everywhere, will give equilibrium is to assume that at all points the forces making for equilibrium are the same.

The next point to which attention should be directed is that, since the making of a price is the making of a ratio in which quantities of two commodities are exchanged, the price fixed has two features, the ratio and the magnitudes of the quantities. It is customary to regard price as the ratio, but in price fixing we must not forget that the quantities exchanged are involved and rational price fixing considers these quantities. Thus, if men are ordered to exchange ten units of coal against five units of money, they are commanded to exchange two quantities and to exchange at a certain ratio.

If the magnitudes exchanged are fixed then the ratios are fixed. If the ratios are fixed the magnitudes may or may not be fixed. It is obvious, however, that there is no real significance in ratios *per se*: the only rational ultimate interest can be in the magnitudes exchanged. The price equilibrium is really an equilibrium of magnitudes exchanged and all rational price fixing considers the magnitudes exchanged. Price fixing, therefore, involves consideration of the conditions of equilibrium in every individual



transaction and, at any given moment, there is only one price scheme which can give this equilibrium—the scheme which actually tends to be established if there is no control !

This brings us to our third point. The State or other body wielding effective force cannot establish equilibrium in a social economy by decreeing price ratios in general, if these ratios differ from those which are spontaneously produced. If it does fix prices at different ratios it disturbs the equilibrium of supply and demand, a situation in which more or less is produced than can be sold though men are willing to sell, or more or less is demanded than can be produced though men are willing to pay prices that will establish equilibrium. If it fixes the magnitudes it fixes the ratios—but in so doing, *it destroys the very nature of a price.*

A price is the ratio in which two “quantities of property” are exchanged. Properties can only be exchanged by the property-owners themselves. If they are “exchanged by order” they are not really exchanged at all; the power which orders, first “reduces” the properties of both parties and then “extends” their properties—it may, in reality, extend both their freedoms, reduce both or extend one and reduce the other. Such a “transaction” is not a “bargaining transaction” however; it is a “rationing transaction”.<sup>1</sup> Rationing of property or freedom is a “power distribution” and if all “prices” are fixed (and magnitudes to be exchanged also) the social economy is “all framework”, all actions being determined by power.

It must not, of course, be inferred that a rationing scheme imposed by a dictator is inconsistent with equilibrium of any kind whatsoever. All that we wish to demonstrate is that *within a given distribution of property* the only transaction ratios that can be decreed *consistent with this distribution* are the ratios or prices that would spontaneously establish themselves without the decrees. The equilibrium established would not be a *free equilibrium* within the given distribution: it would be a new distribution established by force.

Having shown that a policy of complete fixing of the ratios of exchange by the State is equivalent to the establishment of a complete rationing system the question still remains: What is the position if the State fixes some prices or regulates maxima and minima in price ratios, or regulates quantities of resources and services sold? Do these policies cause disequilibrium?

The fixing of any price in any way at a ratio that differs from the one which would be fixed voluntarily is a policy which changes

<sup>1</sup> Commons, J. R., *Institutional Economics*.

the distribution of property within which exchange is possible<sup>1</sup> In so far as we consider the original distribution as our datum then all State interference establishes a condition which is inconsistent with *free equilibrium*. A new equilibrium will tend to establish itself free within the limits allowed, but not free beyond these limits. The regulations give a new distribution of freedom and the price scheme establishes itself freely within this distribution.

The condition of rational administration in the form of pricing or other trading regulations is an awareness of the results of such regulations. When controls of price and trade are effected the freedoms that are left are exercised towards ends decided by those who have the freedom. It is possible to make regulations that are inconsistent with ends desired by those who make them. Such regulations are irrational and the history of State activities abounds in examples.

Tariffs may be imposed on foreign produce imported into this country, and these tariffs affect the prices and the quantities bought and sold, these changes react on exports. It may be perfectly rational to pursue a policy of high tariffs or even prohibitions of imports, but it is not rational to do so and expect to maintain a rising export trade. Regulations can only be regarded as rational if they are made in the light of an understanding of the ways in which the freedom left will be exercised, otherwise the avoidance of disequilibrium is accidental since incompatibilities in the framework lead inevitably to conflict.

The fact that one person can only affect another's activity by altering this other person's "framework" has immense significance when we consider attempts proposed or attempted to "plan" our present economic system by continuous or frequent decrees from a central authority. Whether it be by price interference, sales regulations, production or consumption regulations, every decree of the State constitutes a new element in the framework to which individuals must adjust the exercise of their freedoms. Like "progress" or change by new inventions or discovery which bring to light new and hitherto unknown elements in the framework, State activity is a dislocating force to somebody. It may expand some liberties, but it restricts others, and throws them into disequilibrium.

Decrees may forbid buying and selling but they cannot forbid men considering the ratios at which they would be prepared to exchange. If men have any freedom at all these possible prices appear as desirable prices and, if not established, they constitute

<sup>1</sup> See pp. 164-5 where it is shown that a change of possible substitution ratios alters the quantities of resources held.

strain If they are allowed to make prices, every change in the framework involves a change in the price scheme Frequent changes in property, then, involve frequent changes in the price scheme and, therefore, they involve the necessity for continuous adjustment. They may be so frequent as to be bewildering and in such an extreme case, "planning" defeats its own end.

In a very small community and a community in which the division of labour is not very extensive, in which the roundabout method of production has not proceeded very far, where all persons are known to one another, where all reactions can easily be foreseen, the patriarch or other ruler may make frequent change in freedom distribution and cause no perceptible disequilibrium or at least only such an amount that it can easily be corrected, but in a very complex system of sale and purchase amongst people separated by long chains of economic processes, the reactions to decrees may be beyond the ken of any man or group of men and when an extensive roundabout system of production is employed with long periods of production, the effects of change of property may be, indeed, extremely disturbing on prices.

Since all socio-economic "ills" reside in the "framework" of men's freedoms to use resources directly or by exchange, and since all changes effected by the State involve changes in this framework, we must observe that all attempts to remove these "ills" through the agency of the State, or other authoritarian institution, will cause a certain amount of dislocation in some part of the system unless all in the community can behave in a condition of perfect awareness of the changes that will take place, a condition that never exists. The "cost" of social progress—of building a new social framework—is, like the cost of all "progress", a certain amount of dislocation Even in the exchange system of the market, a change of taste or a new method of production *changes prices* and this change dislocates somebody to some extent. A dynamic system is inevitably one in which there is a certain amount of dislocation it is one in which there is a constant tendency to equilibrium but there is a continuous intrusion of new elements into the framework of men's freedoms. State activity, in redistributing property, is an equilibrating and disequilibrating factor

A dynamic organization is one in which schemes of values are constantly changing When values change, schemes of administration change, and, inevitably, some individuals and groups find themselves in more restricted circumstances and others are given greater freedom. Since men lay down their schemes of dispositions of resources ahead or live according to routine, tradition, habit, etc., it follows that new schemes of freedom involve some in dislocation

and others in fields of wider possibilities. In the "exchange system" this means that some are involved in pecuniary difficulties and their businesses and homes are made impossible to conduct on accustomed lines. Others make profit and are able to increase their businesses or expand their standards of living. In the "political" system, "framework" changes give, to some, greater power and, to others, less—a new equilibrium of power is sought and this expresses itself in a new distribution of freedom or property rights. Dynamic forces give new substitution possibilities to individuals and these are developed by the effecting of new "rationing transactions" through power and new "bargaining transactions" through exchange.

Society can only approach equilibrium when it ceases to be dynamic. The removal of "dynamism" means the increase of man's awareness, of his knowledge of the nature of himself and his environment. Increasing awareness means increasing rationality so the attainment of perfect equilibrium means the attainment of perfect rationality.

The question at the head of this chapter, Is our social economy tending towards ultimate equilibrium? would seem to be unanswerable. To the extent that men behave more and more rationally it may be said that they approach an equilibrium, but we cannot say whether an ultimate equilibrium is being approached for we do not know what will be discovered of new possibilities, new desires, and new powers. Men act within their field of awareness; they construct their legal framework, they develop their habits, customs, understandings and codes and, within this framework, they exercise their individual freedoms. They aim at equilibrium but they travel towards it unaware of changes that may take place in knowledge, unaware of the "pressures" they may be accumulating in various parts of the system, liable to sudden and disturbing release.<sup>1</sup>

Some authorities have claimed that the history of human rationality is the history of the economic system by which is meant the pricing or exchange system. In one sense this is perfectly true. To the extent that prices are stable or in equilibrium there is an acceptance of the property distribution and men can make rational calculations of the advantages and disadvantages of their actions. In another sense, however, the statement seems to be less than adequate. Beneath the pricing system is the property system and beneath this is the distribution of power. Increasing rationality implies an increasing awareness of the distribution of power and of its possible distributions in the future. Increasing awareness of the

<sup>1</sup> Hobhouse, L. T., *The Rational Good*, pp 94-5.

distribution of power ensures more and more of bargaining, but the bargaining must take place in the political sphere as well as in the market place. Market prices are not the only prices that mark the development of rationality.

The rational determination of the distribution of property remains then, the greatest socio-economic problem,<sup>1</sup> and, in a dynamic system, this distribution must be rationally determined continuously if the system is not to run into disequilibrium. The condition of rational determination of property (including the definition of contract law) is that those who declare the law shall pay heed to the circumstances that make men dissatisfied with it or, alternatively, behave irrationally, and this involves their understanding of human needs or making such conditions as shall enable men to behave rationally.

The making of a framework of laws and other rules within which men shall be able to administer their resources rationally is a form of economic planning. And it is the only form of planning that can be effected, logically. Every form of planning, no matter what the declared intention of the planners may be, is this construction of a framework. There may be "good" plans and "bad" plans, but they are all "frameworks" of freedom. They may be defined in such a way as to make men tend to act in incompatible ways or in ways that involve no incompatibility, but they can only be frameworks of freedom to exchange or use resources directly.

This does not mean that there cannot be a very extensive substitution of rationing transactions for bargaining transactions in a community of men: on the contrary there can be. A complete substitution of this kind can only take place where there is a single dictator responsible to nobody but himself. Immediately there is compromise or rational adjustment between two or more persons there is bargaining, though the bargaining may be of the "political" order.

Part of the process of making a rational distribution of property consists in the consideration of entirely different distributions from that which exists to-day, of building in the imagination new social orders. It is part of the function of the economist to examine these proposed schemes to discover if they involve any incompatibilities.

One of the most important schemes of reorganization suggested is the communist scheme and it is the function of the economist to examine this. It is no part of the purpose of this book to enter into such discussion, but what has been said in this section should

<sup>1</sup> Mises, L. von, *Economic Calculations*; *Collective Economic Planning*, ed. Hayek, pp. 87 et sqq.

throw light on the issues raised by such a proposal. We shall touch very lightly on these issues.

In the first place it should be noted that all schemes which propose the abolition of property are inconsistent if they do not envisage a single dictator who issues detailed orders concerning all behaviour. Any freedom allowed is a property right in essentials since any freedom means the freedom to use resources.

If political freedom is allowed and so-called freedom of exchange is disallowed, an incompatibility is established. Men may be forbidden to "trade" but if they have political freedom, they "barter". Proposals to abolish trade in the form of exchange of goods and/or services in a politically free community amount to a transference of the process of allocating resources from the "economic" field to the "political" field. In a democratic communism the "rationing transactions" are not really rationing transactions; they are bargaining transactions in the "political" sphere. They cannot be simple rationing for rationing implies no freedom of the rationed persons while democratic communism assumes freedom in determining the rations. Criticisms of communism on the ground that it takes away freedom are not completely valid since freedom is left in politics.

Nor can it be said that in communism there is no "social valuation" and there are no prices. There are prices but they are not expressed as in our present economy. The most valid criticism of communism in this respect is that based on a consideration of the practicability of considering all possible methods of utilizing all the resources available so that the bargaining in the political chambers may be conducted rationally. Where men possess freedoms with respect to specific resources and freedom to make exchanges they are able to establish an equilibrium of sorts and all are able to administer rationally and more or less precisely. But where prices are not established with respect to specific resources the calculation of values is cumbrous and far from precise.

There is one thing which cannot be done and yet it is frequently urged as a practicable proposal. Men cannot define the freedoms known as property and personal rights and, *at the same time*, determine how these freedoms shall be exercised.

It has been one of the main theses of this book that the systems of forces known ordinarily as economic and political are, in reality, one system, and that the principle of economy controls political and economic activity pursued rationally.

We have, in the latter part of this work, shown the nature of the process of making the framework within which liberties are exercised. We have shown that a rationing of goods and

work is a system in which individual liberty is eliminated. It must be noted, however, that in a communist system the destruction of some forms of liberty may be compensated by the distribution of other forms. A redistribution of property is a redistribution of freedoms and restraints, and communism, being a redistribution of freedoms, is a redistribution of property. There is no means available to the economist to enable him to pass judgment on the merits of any particular distribution of property.

The extreme proposals of *laissez faire* in the exchange system and communism in the so-called economic system make assumptions of doubtful validity. The former relies upon the pricing system to establish an equilibrium of power; the latter relies upon the balance of power to give such a distribution of individual freedoms to use resources that there will be no tendency to modify it by private exchange. If we may assume that our society is destined to reach equilibrium it is clear that the distribution of property must be such that there is no tendency to change it by means other than free exchange.

In the meantime, it would seem, progress towards equilibrium requires that men shall possess private property but the community shall modify it and regulate it. In the market place and the political forum, men strive to place resources, how, when and where they are wanted. Working, as they do, through the specialized institutions of the market, voluntary societies and the State, it will inevitably occur that there will be, at times, strains between forces producing the framework and the forces of freedom within the framework. Such disharmonies need to be resolved if the principle of economy is to prevail and it may well be that men, at times, will need to choose between one kind of disequilibrium and another. Changes in the framework inevitably mean dislocations in the pricing system, since one of its dimensions is time, but changes in the framework are demanded and insisted upon when men can make what they regard as satisfactory substitutions in the framework: if they are not made then the principle of economy is abrogated.

John Stuart Mill claimed, in conformity with the ideas of his Classical predecessors, that the foundation of an economic system is the recognition by men of the sanctity of property and the sanctity of contract, the latter being implied by the former. Our analysis of men's economic relationships has revealed the fact that, to the individual, such acceptances are necessary to an orderly exchange system but that the community cannot regard any given property distribution as sacred. The process of creating a social order is the process of creating an equilibrium and this is a process of defining property rights as well as exercising them freely.

Adam Smith held that philosophers were unproductive workers. From his day to the present there has been a gradual development of economic concepts and analysis, but the difference between the systems of thought, then and now, is as great as the difference between the seed and the tree. In this particular matter this statement is particularly true. The great economic problem is, as we have said above, the rational construction of the framework of law and morality which shall allow of the rational exercise of freedom within it. The construction of this framework requires that the philosophers shall produce their results.

Some social philosophers have urged that "might is right" and so have regarded society as a form of armed camp. These have shown that whatever the right may be it must have might if it is to triumph over those who have aspirations to establish something else. Some have urged that the distribution of property is based on advantage. These have shown the necessity of rational behaviour as a condition of equilibrium. Others have stated that rights are the products of the will to produce the maximum of social well-being. These have emphasized the point that rational action involves the contemplation of a social order. Some have declared that property and freedom alike are the products of man's tendency to establish a harmony between his psychological impulses and his environment, the environment of things and the environment of other men. These show that social welfare is a condition of equilibrium between men and things and men and men.

In the final equilibrium—if ever there could be one—right must be supported by might, the distribution of property and freedom must be such that men have no desire to change it, the distribution of advantage to all must be such that, whatever maximum social well-being may be, it is attained. Economic equilibrium is attained when men's interests and impulses are harmonized. The principle of economy is, then, identical with the principle of right conduct and the right uses of resources in every sense in which the term "right" may be employed with respect to conduct and use.



## APPENDIX

### NOTE ON THE ECONOMICS OF VOLUNTARY CONTRIBUTIONS AND CO-OPERATION

In all communities there is an extensive amount of activity which is maintained by voluntary contributions of money or other resources. Religious, charitable, educational, "social" organizations in general, fall into the category of institutions whose work is financed through the collection plate or subscription list. The economic problem which such practice poses is, In what way are the individual subscriptions determined?

It is easy to see, of course, that, when a person pays his subscription to any of these institutions, he may regard it as a kind of price which he pays for the service which he derives therefrom. The fact, that when he makes a charitable donation he "confers a service" on the beneficiaries, does not imply that he himself derives no benefit therefrom; on the contrary, the "service" which he renders to others is a service to himself in that he considers it "worth his while" to render this service. We may say, then, definitely, that a subscription is a price and our problem is a price problem.

The likeness of a subscription to a price is seen very clearly in the case of a fixed subscription as the condition of membership of a voluntary society, the amount to be paid is stated and a person pays it if he considers it worth while and does not pay it if he thinks it is not worth while. The likeness of a gift to a price is seen equally clearly in the case of a person providing his child with pocket money or maintaining a poor relation in whom he has a particular interest. He "gives" what he can afford or "buys" the "service of serving others", weighing the costs and advantages as in a market—viewed from the economist's point of view, that is, and assuming his gifts rationally made.

These two types of subscription or gift call for no special comment, they are simple allocations of money falling into an individual's purchasing scheme. The real problem is the determination of the magnitude of the subscription when others also are contributing. A person may feel a particular, individual responsibility in maintaining an old and poor parent, but he feels an interest in common with others in maintaining or assisting the poor in general. What he pays is, therefore, determined by the payments or expected payments of others. In this case we are reminded of the determination of an ordinary price in the market; no individual will give, for a service in the market, more than he can afford, but the price he actually pays is not determined by himself alone but by himself and others, supplying and demanding the service. The ordinary subscription to a voluntary society is, like an ordinary price, *socially determined*, it is determined by the quantity of resources required and what the willing subscribers can afford to "give."

This last case is really a case of *co-operative administration*, the use of their means, by more than one person, in the attainment of a common immediate end. It is necessary to say that the end is immediate because the ultimate ends of the subscribers may not be identical; they are, in fact, in all cases, individual and personal. The ends pursued by co-operators are objectively definable and are, in all cases, certain patterns of resources.

Now it is the essence of the co-operative pursuit of a common end that the co-operators shall pursue this end, it is not essential that they shall all pay or contribute to the limit of what they are willing to pay rather than allow the end not to be attained. It is not, in other words, an essential condition of co-operation that a person shall disregard the possible contributions of others. Rational co-operation implies economical administration and gifts must, therefore, be given out of a consideration of their necessity. Co-operation is not charity.

In attempting to discover a solution of our problem we may pursue a course frequently pursued in the discussion of the circumstances which determine exchange prices and consider (a) the case of *two persons only* deciding how much to contribute to a given common end, and (b) the case of *many persons* deciding their amounts of contribution. We will further simplify the case by considering, in the first place, a common end whose money value is known—say the purchase of a picture of the value of £200 to present to a public gallery, then we will consider the case of a service whose "total cost" is not limited, as, for instance, the service rendered by a hospital or the Salvation Army, though the prices of the necessary resources to be used by these institutions are known.

*Case I (a)*—In this case, two persons, A and B, wish to see hung in a public gallery, a picture whose market price is £200. Each of these persons is willing to give a certain amount as a maximum, rather than allow the picture not to be hung in the gallery. What will each give?—

Let  $a$  and  $b$  be the maximum amounts that A and B are respectively willing to give. Then there are three possible situations.—

- (i) If  $a + b = £200$ , each will contribute his maximum;
- (ii) If  $a + b$  is less than £200, the picture will not be hung,
- (iii) If  $a + b$  is greater than £200, the amounts to be contributed will be indeterminate.

Situation (i) is determinate, each pays the maximum which he can afford and there is no information which will allow us to state their relative "affording" strengths. Each contributor fixes his contribution according to his means and his scale of preferences or schemes of valuation.

Situation (ii) is also determinate, each party paying nothing. The given conditions preclude the possibility of the seller lowering his price from £200 to £( $a + b$ ) which is the maximum they will pay.

In situation (iii) also, adjustment through the seller raising his price to the maximum ( $a + b$ ) is precluded, and the only way of "determining" the shares is by "higgling" or "playing for position". There are limits, however, between which each person's contribution must lie.

If A pays his maximum  $a$ , then B will pay his minimum of  $\pounds 200 - a$ ; If B pays his maximum  $b$ , then A pays his minimum  $\pounds 200 - b$ . Thus A pays something between  $(\pounds 200 - b)$  and  $a$ , and B pays between  $(\pounds 200 - a)$  and  $b$ . If we substitute  $\pounds 75$  for  $a$  and  $\pounds 150$  for  $b$ , then the pairs of limits are (i) for A,  $\pounds 50$  and  $\pounds 75$ , (ii) for B,  $\pounds 125$  and  $\pounds 150$ . The actual amounts paid will be "determined" by A trying to convince B that he is willing to give very little and B trying to convince A of his similarly low willingness or ability.

A further matter for investigation in this case is that of the equality or inequality of magnitude of the subscriptions. It is clear that there is nothing in our argument which suggests that either relationship is dictated. Equality or inequality depends upon the relationship between  $a$ ,  $b$ , and  $c$  (the amount required), and this relationship is part of our data. Each of the first two quantities is the maximum that the subscriber *can afford to pay*, he himself being the judge. The conditions can, however, be stated which will give (a) a determinate equality, (b) a possible equality.

If we let the market price of the service desired by A and B be represented by  $c$ , then it follows that if  $a = b = \frac{c}{2}$  each of the parties will contribute one half of the cost. Since A's maximum equals B's maximum, then A's minimum equals B's minimum, and since each maximum is one half of the total, then each minimum is the same amount, and the range of indeterminateness is zero.

If  $c$  is less than  $(a + b)$  the contributions are indeterminate, but the only possibility of their being equal is that  $a$  and  $b$  are both equal to (as we have already shown), or greater than  $\frac{c}{2}$ . Even though each is willing to pay more than half, equality is not the only relationship possible between the contributions; they play for position, and one may pay less than half. In all cases where one of the parties is willing to pay less than half as his maximum, there must be inequality. This inequality is a "voluntary discrimination".

*Case I (b)*—Having considered the determination of individual subscriptions towards a certain defined sum we must now consider the determination of these subscriptions towards a "cause" upon which unlimited amounts might be spent. In this case each of the parties will have in mind the total service which may be bought with the joint subscription and, since the work that may be done is elastic, it follows that, when one of the parties has made a subscription, the other will be prepared to reconsider his and make addition or subtraction. This case can best be presented by the use of a diagram, as below (Diag. I).

The horizontal axis is the scale of A's subscription, and the vertical axis is the scale of B's subscription. Curve BB shows the amount B is willing to contribute at any given subscription made by A. Curve AA shows the amount A is willing to contribute at any given subscription made by B. They may be called A's and B's supplementary contributions curves respectively.

Let A make a subscription of  $Ox$ . B then adds  $x_1$  (or  $Oy$ ). If B gives  $Oy$ , however, A will give  $Ox_1$ . This contribution by A then induces B to make his  $x_1l_2$  and so the adjustment goes on till the point of intersection of the "supplementary curves" is reached, when A gives  $OX$  and B gives  $OY$ .

If we start the process by A giving  $Ox^1$  a similar movement takes place through adjustment until the same point of intersection is reached. This point is a determinate point when the *supplementary curves* are given.

The supplementary curves must intersect if there is to be a limit to the adjustment and they must intersect in the manner shown, AA being positively inclined to BB at the point of intersection. If the curves cut in the opposite sense then both parties will move away from the quantities which are the co-ordinates of the point of intersection, towards zero or infinity. The cases in which subscriptions are made cannot be "zero" cases, and in no instance will subscriptions be infinite.

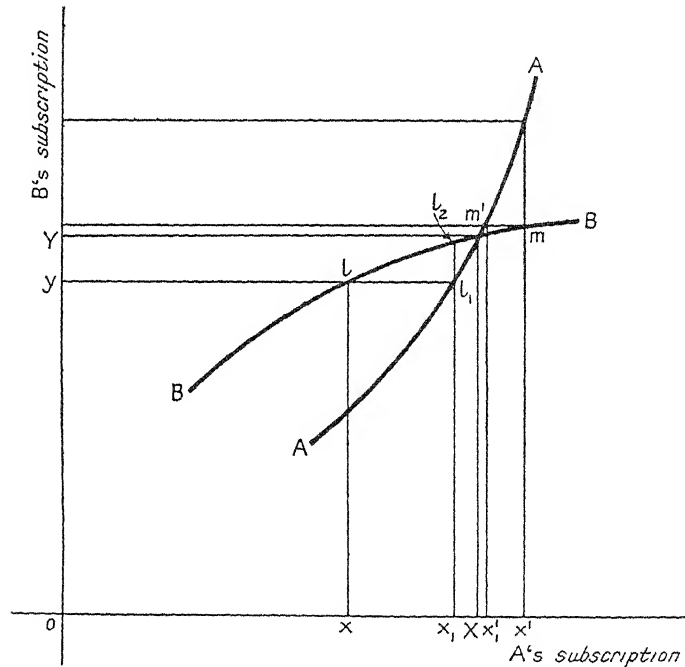


DIAGRAM I

*Case II (a)* —We must now consider the case of many subscribers to a given amount. It will facilitate our exposition if we employ a device similar to that of imagining an auctioneer calling a price in the auction room until the supply and demand are equal. In this case, however, we imagine an *appeals maker*, calling for subscriptions of increasing amount until he has the requisite total.

Again it must be noted that every person will have in mind a maximum subscription which he would make rather than allow the appeal to fail, at the same time there will be a general tendency towards economy, each subscriber hoping, we may say, that his subscription need not be the maximum.

If, for the moment, we assume the willingness and perfect readiness of every person to pay his maximum it is clear that as the appeal for £1, £2, £3, etc., is made the sum will be made up of the maximum subscriptions of those whose maxima are least and those whose maxima are highest will pay less than their maxima, the difference between actual and maximum being greatest in the case of the person with the highest maximum

If, on the other hand, we assume the same degree of eagerness on the part of subscribers and the appeal maker starts with a subscription of the total required, descending in the scale of subscription, Dutch-auction-wise, it is clear that those who have small maxima will escape or tend to do so

We cannot assume this eagerness nor can we easily envisage this auction-appeal taking place. There will be considerable playing for position, and we must approach the problem as in case I (a)

Here, as in that case, the total maximum payments which subscribers are willing to pay may be equal to, greater or less than, the price of the service. If it is less, then the service is not bought and if it is equal, then all subscribers pay their maxima

If the total of maxima is greater than the total required the contributions are indeterminate in amounts. Each subscriber will have a maximum and a minimum. His maximum is what he will be willing to pay rather than let the appeal fail while his minimum is the difference between the total amount required and the sum of all other maxima or zero, whichever is greater. There is a mathematical possibility of his minimum being a negative amount, but since we do not consider the case of "excess" subscriptions being distributed amongst subscribers we place zero as the minimum. (This position is, of course, possible in Case I (a))

In an ordinary appeal for a fixed amount the common custom is that of announcing the growing total. This enables a person to adjust his subscription in the light of a varying required sum and on calculations of the probabilities of other sums being given. It will be the practice, therefore, for subscribers to "try out" small subscriptions compared with the amounts they are willing to pay as maxima and then make further adjustments. The amounts are indeterminate.

Equality of subscriptions is determinate when all maximum amounts that subscribers are willing to make are equal, and are equal in total to the whole amount required divided by the number of subscribers. There *may* be equality if all are willing to pay, as maximum, an amount equal to or greater than their "equal share" of the total. If there are  $x$  subscribers and any person is willing to pay as maximum less than  $\frac{1}{x}$

of the total required, there must be inequality and in all cases, except that in which all maxima equal  $\frac{1}{x}$  of the total required, there may be inequality or voluntary discrimination. The greater the "eagerness" the nearer a person is likely to subscribe to his maximum, the means possessed will also affect amounts offered.

There is no rule that one can lay down with respect to the relationship between means and maxima.

*Case II (b)*—This is one of the commonest forms of voluntary contribution schemes. It is the case of many people subscribing to a

service which can be extended as means increase. The method is that of the open subscription list for a public charity or social service such as a hospital.

The circumstances which determine the amount of contribution which a person makes are many, but we may summarize them as (a) interest in the service (including such things as "personal advantage" when this exists), (b) the means possessed by the subscriber, and (c) the amount which the subscriber considers others will give or have given. The relationship which is pertinent to this analysis is that between the amount a person is willing to give and the amount which is already forthcoming or expected, in other words, we are interested here in a person's subscription as a "function of the amount already subscribed or expected to be subscribed."

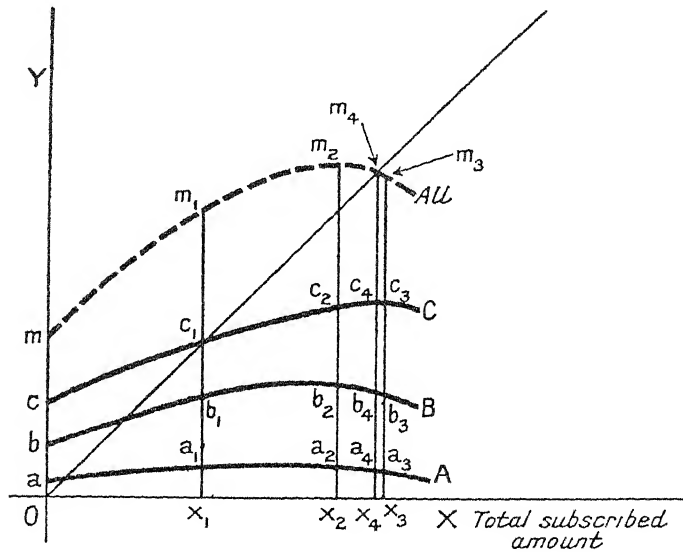


DIAGRAM II

The precise variation of a person's subscription according to the magnitude of the total subscribed amount is, of course, impossible to state. It is true to say, however, that, when the total increases, some will increase their contribution on the ground that they will be more effective on such a scale while others will restrain their giving on the ground that further contributions are less necessary. It may be true to say that practically all have the first reaction at some stage of the total's growth and it is certainly true to say that the second reaction always comes ultimately, no person can give everything to any single purpose continuously, the case of a person sacrificing his whole life for a cause is not forgotten but it is not regarded as normal. From this it follows that a curve showing the subscriptions which a person is willing to make as the magnitude of the total subscribed amount

increases, may be regarded as normally rising to a maximum and falling beyond. And it follows, further, that there is a maximum amount which can be raised for a given purpose, from a given group of persons.

The situation which exists, when more than two subscribers are operating, may be depicted by diagram (II). The horizontal axis  $OX$  is the scale measuring the magnitude of the total subscriptions, the vertical axis  $OY$  is the scale of the subscriptions which the individuals A, B, and C are willing to make, at each point on the "total" scale. The full curves represent the amounts which the individuals are willing to contribute as the total contributed varies.

Since the horizontal axis measures the total fund and the vertical axis the individual contributions *and their sum*, it follows that (with equal scales employed), the point of maximum total subscription will be at the point of intersection  $x_1m_4$ , where the ordinate  $x_1m_4$  equals the abscissa  $Ox_4$ .

The method of reading this diagram should be noted. When the total subscribed amount stands at zero, A, B, and C are willing to subscribe  $Oa$ ,  $Ob$ , and  $Oc$  respectively or  $Om$  altogether.  $Om$  equals  $Ox_1$ . When the total is  $Ox_1$ , the subscribers are willing to make their subscriptions  $x_1a_1$ ,  $x_1b_1$ ,  $x_1c_1$ , respectively or  $x_1m_1$  altogether;  $x_1m_1$  equals  $Ox_2$ . At  $Ox_2$  the subscribers adjust their contributions to  $x_2a_2$ ,  $x_2b_2$ , and  $x_2c_2$  respectively or  $x_2m_2$  in all,  $x_2m_2$  equals  $Ox_3$ . At  $Ox_3$  the amounts that the subscribers are willing to give are  $x_3a_3$ ,  $x_3b_3$ , and  $x_3c_3$  respectively or  $x_3m_3$  in total,  $x_3m_3$  equals  $Ox_4$ , which is rather less than  $Ox_3$ . At  $Ox_4$  the amounts to which the subscribers make their adjustment are  $x_4a_4$ ,  $x_4b_4$ , and  $x_4c_4$  respectively or  $x_4m_4$  in total.

In arriving at this position there may be oscillation about the point for a time. The diagram, then, shows the individual amounts that will be paid and the total amount.

The condition of equality of subscription is, of course, that all the individual curves coincide and since these curves are based on individual estimates of the worthwhileness of the service, and individual valuations of their own resources with respect to these estimates, it is unlikely that they will be equal. Inequality or voluntary discrimination will be the rule.

If we assume a condition of equilibrium to be reached, as, for instance, if all the subscribers settle down to an annual subscription of a fixed amount in an unchanging system, it is clear that we ought to be able to apply the marginalist analysis to the situation. And so we can, but an interesting case is presented.

In equilibrium, each person will have made his contribution of such a magnitude that, if he changes it by a very small amount (assuming very fine adjustment possible), the value of the additional service "purchased" is just equal to the value of the subscription increment, the marginal purchase is just worth the "marginal price". But when he makes his marginal change, the other contributors (in theory) make small adjustments also, it follows, therefore, that the additional service is made possible by all the adjustments together. Thus, if the position is such that when A increases his subscription by a shilling, B increases his by 6d and C by 2s, then the service involving 3s 6d. of expenditure is what A receives for his shilling. Each person's marginal purchase involves the expenditure of all contributors'

"complementary contributions" If we prefer it, we may say that the final shilling of the total subscribed amount has, to each subscriber, a utility which is equal to that of his contribution to that shilling.

This presents us with a curious corollary. If the marginal purchase of the voluntary society "costs" a shilling we have a service whose "objective price" is one shilling but one whose "subjective prices" are the complementary contributions, say,  $2d$ ,  $4d$ , and  $6d$  to A, B, and C respectively. There seems to be no counterpart to this in the ordinary organization on a "contractual" basis.

Throughout our analysis we have used money resources, and we have bought services with money. We have assumed, therefore, a given price scheme and have shown how voluntary co-operative activities may be dovetailed into an ordinary individualistic system. What we have said is sufficient to suggest the nature of some, at least, of the contributions made to the State in an ordinary community.

When men are concerned to pursue common ends, the position is one in which they are willing to make voluntary contributions. To some extent, the State may be regarded as a "voluntary organization" pursuing certain common ends. In so far as it is such an organization, it follows, from what we have said above, that there will, in all probability, be a considerable amount of "voluntary discrimination." Men will pay "voluntary taxes" according to their own valuations of the services and according to what they expect others will pay.

With great inequalities of income we may expect great inequalities of contributions. There seems to be, in this, a suggestion of a possible basis of progressive taxation. Some services can only be acquired if the rich pay more than the poor in proportion to their incomes and, to some extent, progressive taxes may approach what they would give if an ordinary voluntary society were organized for the rendering of the service. In short, progressive taxation may, to some extent, be regarded as based on the result of experience, the experience that shows that rich people will pay for ordinary essentials, say, more than the poor; if experience shows that they will, in voluntary societies, make "discriminatory contributions", then a rule or custom is developed that they must pay "discriminating taxes" to the State. Of course, this is not a full explanation of progressive taxation for there is, no doubt, a great deal of compulsion in the scheme, ordinarily, as we have shown in the chapter dealing with the principles of taxation.

The question now arises, however, as to whether a whole society could be run on "voluntary" principles, a society in which every person's living conditions might be regarded wholly as a matter of common interest rather than as his own in particular, and one in which all social services were provided by voluntary contributions. Whether such a society should be regarded as "voluntary" communism or anarchism it is difficult to decide. In such an organization there would be no pricing scheme, such as we have at present, though there would be a mass of subjective or individual valuations.

The problem of such a society, it is clear, would be to discover the voluntary contributions which all would be willing to make for all the possible distributions of services amongst the contributors. This brings us back to the issues raised in our final chapter.

This analysis of the process of running a voluntary society is, as we have already suggested, an analysis of co-operative activity. The



essence of co-operative activity is the pursuit of a common end, and it implies that men make voluntary contributions of their resources to the common end. The extent to which they work towards common ends is the measure of community amongst a group of men, and it follows, therefore, that, if a "full community" is to be produced, it is essential that common ends be developed more extensively. In the meantime the economics of "voluntaryism" or co-operation needs to be developed. This chapter is a slight suggestion of the kind of problem which "groupalism" or "institutionalism" raises.

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